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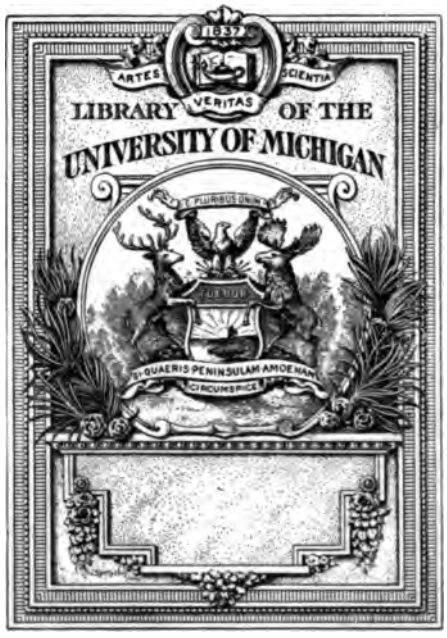

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TREASURY DEPARTMENT

Public Health and Marine-Hospital Service of the United States

WALTER WYMAN, Surgeon-General

HYGIENIC LABORATORY.—BULLETIN No. 36

M. J. ROSENAU, Director

APRIL, 1907

STUDIES UPON HYPERSUSCEPTIBILITY AND IMMUNITY

By

M. J. ROSENAU

and

JOHN F. ANDERSON

WASHINGTON

GOVERNMENT PRINTING OFFICE

1907

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STUDIES UPON HYPERSUSCEPTIBILITY AND IMMUNITY.[a]

By MILTON J. ROSENAU,

Passed Assistant Surgeon, Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service,

and

JOHN F. ANDERSON,

Passed Assistant Surgeon, Assistant Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

We have shown[b] that horse serum is apparently a bland and harmless substance when injected into a normal guinea pig, but this injection renders the guinea pig susceptible to a subsequent injection of horse serum. At least ten days must elapse between the first and the second injection for this hypersusceptibility to manifest itself.

The present bulletin gives the results of our further work upon this interesting phenomenon. We have endeavored to obtain a deeper insight into the cause and nature of hypersusceptibility and have attempted to localize the phenomenon in certain fluids, cells, or organs of the body.

We foresaw last year that the problem of hypersusceptibility has an important bearing upon the question of immunity and expressed the opinion[c] that "resistance to disease may be largely gained through a process of hypersusceptibility. Whether this increased susceptibility is an essential element or only one stage in the process of resistance to disease, must now engage our attention." We can not escape the

[a] Manuscript submitted for publication April 27, 1907.

[b] Rosenau, M. J., and Anderson, John F.: A study of the cause of sudden death following the injection of horse serum. Pub. Health and Mar.-Hosp. Serv., Hyg. Lab. Bull. No. 29, 1906.

———: A new toxic action of horse serum. Journ. med. research, Vol. 15, No. 1 (n. s., Vol. 10, No. 1), July, 1906, pp. 179–208.

Anderson, John F.: I. Maternal transmission of immunity to diphtheria toxine. II. Maternal transmission of immunity to diphtheria toxine and hypersusceptibility to horse serum in the same animal. Pub. Health and Mar.-Hosp. Serv., Hyg. Lab. Bull. No. 30, 1906, and Journ. med. research, Vol. 15, No. 2 (n. s., Vol. 10, No. 2), Sept., 1906, pp. 241–260.

[c] Rosenau, M. J., and Anderson, John F.: Hypersusceptibility. Journ. Am. Med. Assn., Vol. 42, No. 13, Sept. 29, 1906, pp. 1007–1010.

conviction that this phenomenon of hypersusceptibility has an important bearing on the prevention and cure of certain infectious processes. Our work this year upon the hypersusceptibility produced by the bacterial proteids strengthens this belief, for our results prove that the phenomenon of hypersusceptibility to certain proteid substances extracted from the bacterial cell is followed by a definite immunity against infection by the micro-organism.

Since our studies last year several papers have been published which, in the main, have corroborated our findings.

McClintock and King[a] gave ten guinea pigs from $\frac{1}{10}$ to 1 c. c. of horse serum by the stomach and thirteen days later 6 c. c. of serum, either subcutaneously or intraperitoneally, without causing symptoms in any of them. They conclude that the sensitizing action of horse serum given by the mouth is not nearly so great as when given subcutaneously or intraperitoneally. This is in confirmation of our reported experiments.

Currie[b] has studied the effect of repeated injections of horse serum in persons admitted for treatment in the city of Glasgow Fever and Smallpox Hospital at Belvidere. He concludes that it is apparent from the facts detailed by him that repeated injections of horse serum induce symptoms of supersensitation in man, but it is also apparent that the same facts lend no countenance to the suggestion that the death of persons suffering from diphtheria is to be apprehended as the result of repeated injections of antidiphtheric serum.

Besredka and Steinhardt[c] studied with much care certain features of hypersusceptibility to horse serum in guinea pigs; they note that the French serums are much less toxic than those used by Otto in Frankfurt and the serums used by us. Besredka and Steinhardt had a mortality of about 25 per cent when 5 c. c. of serum was given intraperitoneally at the second injection, whereas death was the rule in our experiments under similar conditions. Most of their work was done with doses of 0.05 to 0.25 c. c. given directly into the brain, which either killed or caused grave symptoms in susceptible guinea pigs. Besredka and Steinhardt lay stress upon the production of "anti-anaphylaxis," which we termed "immunity." They found that a single injection of serum given into the peritoneum of a sensitized guinea pig conferred immunity to a subsequent injection of 0.25 c. c. into the brain; in one case the anti-anaphylaxis was present one and a

---

[a] McClintock, Charles T., and King, Walter E.: The oral administration of antitoxins for prevention of diphtheria, tetanus, and possibly sepsis. Journ. infec. diseases, Vol. 3, No. 5, Oct., 1906, pp. 700–720.

[b] Currie, J. R.: On the supersensitation of persons suffering from diphtheria by repeated injections of horse serum. Journ. hyg., Vol. 7, No. 1, Jan., 1907, pp. 35–60.

[c] Besredka, A., and Steinhardt, Edna: De l'anaphylaxie et de l'anti-anaphylaxie vis-à-vis du sérum de cheval. Ann. de l'Inst. Pasteur, Vol. 21, No. 2, Feb. 25, 1907, pp. 117–127.

half hours after the injection into the abdominal cavity. They were unable to demonstrate any protective properties in various organs of immune guinea pigs, confirming our work along the same lines.

Nicolle[a] found that guinea pigs were not susceptible to the necrotic action induced by repeated injections of horse serum, as is the case in rabbits; this corresponds with our observations. He also found that daily injections or "spaced" injections, after the method of Arthus, did not induce a high degree of hypersusceptibility in guinea pigs.

Besredka[b] questions whether we should not consider this toxic property of horse serum, as well as its antitoxic power. He suggests that a serum, 0.05 c. c. of which when given into the brain will kill or cause grave symptoms in a sensitive guinea pig, should be considered as above the average toxicity and ought to be excluded from use in man.

The work of Otto[c] on the "Theobald Smith Phenomenon," and of von Pirquet and Schick[d] upon "the serum disease" has been previously referred to.

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[a] Nicolle, Maurice: Contribution à l'étude du phénomène d'Arthus. Ann. de l'Inst. Pasteur, Vol. 21, No. 2, Feb. 25, 1907, pp. 128–136.

[b] Besredka, A.: De la toxicité des sérums thérapeutiques et dumoyen de la doser. Comp. rend. soc. biol., Vol. 62, No. 10, Mar. 22, 1907, pp. 477–478.

[c] Otto, R.: Das Theobald Smithschen Phänomen der Serum-Ueberempfindlichkeit. v. Leuthold-Gedenkschr., Bd. 1.

[d] von Pirquet, C. Frh., and Schick, B.: Die Serumkrankheit. Leipzig and Wien, 1905, 144 p. 8°.

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Part I.

THE SENSITIZING SUBSTANCE.

We ventured the suggestion in our former publication that the substance that sensitizes the guinea pig is the same as that which later poisons it; profound chemical changes perhaps in the central nerve cells, are probably produced by the first injection. Our subsequent work has produced nothing to alter this working hypothesis.

Vaughan[a] advances the theory that the first injection of the strange proteid is broken up into components, one of which is toxic, but that the animal is not poisoned because this breaking up takes place slowly. The cells, however, learn from this lesson how to break up the complex molecule, so that when more of the strange proteid is introduced at the second injection it is violently rent asunder, quickly liberating large quantities of the toxic principle of the complex molecule.

Vaughan and Wheeler[b] have elaborated this explanation by further studies upon egg-white and bacterial proteids split into poisonous and nonpoisonous portions. These authors believe that when egg-white, or the nonpoisonous portion of egg-white, is injected into a fresh animal certain cells of the body are so influenced that they elaborate a new ferment, which, in the form of zymogen, remains in the cell until activated by the second injection, when it is set free and splits up the egg-white in a manner similar to that used by Vaughan in the laboratory. Vaughan and Wheeler believe that the effect induced in the animal is the same as that caused by the poisonous portions of egg-white as they have split it up in the retort.

Currie[c] suggests that the first injection of serum results after an interval in the formation of an antibody. When the second injection of serum is given, after at least ten days from the first, the antibody-producing substance of the second injection of serum and the antibody

[a] Vaughan, V. C.: Discussion of "Hypersusceptibility," by M. J. Rosenau and J. F. Anderson. Journ. Am. Med. Assn., Vol. 47, No. 13, Sept. 29, 1906, p. 1009.

[b] Vaughan, Victor C., and Wheeler, May: Effects of egg-white and its split products upon animals. A study of susceptibility and immunity. Abstract of papers to be read at twenty-second annual meeting of Assn. Am. Physicians, Washington, May 7-9, 1907, p. 9.

[c] Currie, J. R.: On the supersensitation of persons suffering from diphtheria by repeated injections of horse serum. Journ. Hygiene, Vol. 7, No. 1, Jan., 1907, pp. 35-60.

produced by the first injection come in contact without delay; their union is rapid; the whole charge of the poisonous substance is quickly set free and the toxic symptoms are sudden and severe.

Besredka and Steinhardt[a] had, as a working hypothesis, the following: The sensitized guinea pig which appears in good health has, in spite of its apparent well-being, perhaps a latent lesion of the brain. A second injection of serum, made into the peritoneal cavity twelve days later, is able to awaken this nervous lesion, resulting in grave symptoms or even death.

In view of these theoretical considerations it is important to make further studies upon the sensitizing substance in horse serum and other proteid substances.

The following experiments show that the filtrate from horse serum after precipitation with ammonium sulphate renders guinea pigs sensitive. The filtrate contains most of the serum albumen and very little of the globulins. It is exceedingly weak in antitoxic strength.

G. P. No. 400. Six c. c. antitoxic horse serum (Natl. VIII., 18), intraperitoneally. Marked symptoms.

[Previous treatment: 38 days prior, 5 c. c. filtrate of antitoxic serum, precipitated (NYBH). Subcutaneously.]

This filtrate was kindly furnished us by Dr. W. H. Park from some antidiphtheric serum undergoing the Gibson process of refining.

The following experiments show that formaldehyd does not destroy the sensitizing property of horse serum:

G. P. No. 390W. Six c. c. normal horse (roan) serum, intraperitoneally. Severe symptoms.

[Previous treatment: 47 days prior, 6 c. c. antitoxic horse serum (Natl. XVIII)+1 per cent formalin, 23 hours exposure. Subcutaneously.]

G. P. No. 500W. Six c. c. normal horse (roan) serum, intraperitoneally. Very severe symptoms.

[Previous treatment: 29 days prior, 3 c. c. normal horse (roan) serum+5 per cent formalin, 4 hours 30 minutes exposuure. Subcutaneously.]

The results with formaldehyd have a special significance in view of the fact that this active reducing agent is capable of destroying the poisonous properties of tetanus and diphtheria toxines.

We have shown before that the sensitizing and poisonous principles in horse serum are not dialyzable through parchment paper. From the following limited experiments it would seem that the sensitizing principle is not dialyzable through a collodion sac when placed in the peritoneal cavity of the animal.

G. P. No. B. Six c. c. normal horse (No. 15) serum, subcutaneously. No symptoms.

[Previous treatment: 32 days prior, collodion sac containing about 3 c. c. normal horse (No. 15) serum placed in peritoneal cavity.]

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[a] Besredka, A., and Steinhardt, Edna: De l'anaphylaxie et de l'anti-anaphylaxie vis-à-vis du sérum de cheval. Ann. de l'Inst. Pasteur, Vol. 21, No. 2, Feb. 25, 1907, pp. 117–127.

G. P. No. Cx. Collodion sac containing about 3 c. c. normal horse (No. 15) serum placed in peritoneal cavity.

28 days later, 5 c. c. normal horse (roan) serum, subcutaneously. No symptoms.

1 day later, sac removed.

23 days after removal of sac, 5 c. c. normal horse (roan) serum, subcutaneously. Mild symptoms.

By reference to page 62 it will be seen that guinea pigs may be sensitized by injecting horse serum directly into the heart.

Further work upon the action of the sensitizing substance is in progress and will be reported later.

Part II.

THE TOXIC PRINCIPLE.

We added a number of different ferments, alkaloids, and simpler chemical substances to horse serum in order to modify, destroy, or neutralize its toxic action. All these attempts have so far been found unavailing, as will be seen by the following experiments:

FERMENTS.

The ferments were added to the horse serum and allowed to stand at 15° C. over night.

Taka diastase.

G. P. No. 5417. Six c. c. antitoxic horse serum (Natl. IX., 19)+Taka diastase (PDCo.), subcutaneously. Dead, 90 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Pancreatin.

G. P. No. 5413. Six c. c. same serum+pancreatin (PDCo.), subcutaneously. Dead, 40 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 9+$\frac{1}{600}$ c. c. antitoxic horse serum (A. A 208).]

Rennin.

G. P. No. 5405. Six c. c. same serum+rennin (Hansen's junket tablet), subcutaneously. Dead, 50 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Myrosin.

G. P. No. 5416. Six c. c. same serum+myrosin (from white mustard seed), subcutaneously. Dead, 25 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{700}$ c. c. antitoxic horse serum (A. A 208).]

Invertin.

G. P. No. 5375. Six c. c. same serum+invertin (yeast), subcutaneously. Dead, 80 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{1000}$ c. c. antitoxic horse serum (NYBH 305)].

Emulsin.

G. P. No. 5373. Six c. c. same serum+emulsin (from almonds), subcutaneously. Severe symptoms.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{900}$ c. c. antitoxic horse serum (NYBH 305).]

Pepsin in acid solution.

G. P. No. 5409. Six c. c. same serum+pepsin (Wyeth's) rendered acid with HCl, subcutaneously. Severe symptoms.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{600}$ c. c. antitoxic horse serum (A. A 208).]

Pepsin in alkaline solution.

G. P. No. 5412. Six c. c. same serum+pepsin (Wyeth's) rendered alkaline, subcutaneously. Severe symptoms. (Died 18 hours later.)

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Ingluvin.

G. P. No. 5418. Six c. c. same serum+ingluvin (Warren), subcutaneously. Severe symptoms. (Died 18 hours later.)

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum A. A 208).]

Malt.

G. P. No. 5411. Six c. c. same serum+malt (from corn), subcutaneously. Severe symptoms.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Papain.

G. P. No. 5414. Six c. c. same serum+papain (Merck's), subcutaneously. Severe symptoms. (Died 18 hours later.)

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

ALKALOIDS.

Atropin.

G. P. No. 5408. Six c. c. antitoxic horse serum (Natl. IX, 19)+0.002 atropin sulphate, subcutaneously. Dead, 27 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Strychnin.

G. P. No. 5420. Six c. c. same serum+0.001 gm. strychnin sulphate, subcutaneously. Dead, 25 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Morphin.

G. P. No. 5406. Six c. c. same serum+0.002 gm. morphin sulphate, subcutaneously. Dead, 35 minutes.

[Previous treatment: 27 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 208).]

Caffein.

G. P. No. 5377. Six c. c. antitoxic horse serum (Natl. IX, 19)+0.01 gm. caffein citrate, subcutaneously. Dead, 55 minutes.

[Previous treatment: 28 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{1000}$ c. c. antitoxic horse serum (NYBH 305).]

SALTS.

Calcium chlorid.

G. P. No. 5342. Six c. c. same serum+0.5 c. c. calcium chlorid, subcutaneously. Severe symptoms.

[Previous treatment: 35 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{500}$ c. c. antitoxic horse serum (A. A 201).]

Sodium nitrate.

G. P. No. 5376. Six c. c. same serum+0.3 c. c. 1 per cent sodium nitrate, subcutaneously. Severe symptoms.

[Previous treatment: 28 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{1000}$ c. c. antitoxic horse serum (NYBH 305).]

Sodium chlorid.

G. P. No. 5341. Six c. c. same serum+0.5 gm. sodium chlorid, subcutaneously. Severe symptoms.

[Previous treatment: 35 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{250}$ c. c. antitoxic horse serum (A. A 201).]

Magnesium sulphate.

G. P. No. 5364. Six c. c. same serum+0.2 gm. magnesium sulphate, subcutaneously. Dead, 38 minutes.

[Previous treatment: 35 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{1000}$ c. c. antitoxic horse serum (NYBH 306).]

Ammonium sulphate.

G. P. No. 5384. Six c. c. same serum+0.1 gm. ammonium sulphate, subcutaneously. Dead at once.

[Previous treatment: 28 days prior, 0.139 c. c. toxine No. 5+$\frac{1}{1200}$ c. c. antitoxic horse serum (NYBH 305).]

G. P. No. 7847. Six c. c. normal horse (roan) serum+0.1 gm. ammonium sulphate, subcutaneously. Dead, 23 minutes.

[Previous treatment: 59 days prior, 0.24 c. c. toxine No. 9+$\frac{1}{300}$ c. c. antitoxic horse serum (A 192).]

MISCELLANEOUS SUBSTANCES.

Ox bile.

G. P. No. 7616. Six c. c. normal horse (No. 15) serum+heated ox bile, equal parts, intraperitoneally 3 hours after mixing. Dead, 11 minutes.

[Previous treatment: 45 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{350}$ c. c. antitoxic horse serum (A. A 248).]

Animal charcoal.

G. P. No. 7614. Six c. c. normal horse (No. 15) serum+animal charcoal; shaken up well, filtered, let stand for 3 hours; intraperitoneally. Dead, 20 minutes.

[Previous treatment: 45 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{350}$ c. c. antitoxic horse serum (A. A 248).]

Yeast cells.

G. P. No. 7615. Six c. c. normal horse (No. 15) serum+ground yeast cells; let stand 3 hours; intraperitoneally. Dead, 35 minutes.

[Previous treatment: 45 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{350}$ c. c. antitoxic horse serum (A. A 245).]

FORMALDEHYD.

In view of the fact that formaldehyd has a destructive action upon such "haptin" substances as tetanus and diphtheria toxines, and in further view of the fact that the sensitizing and toxic principles of horse serum seem to belong to the haptin group of substances in the sense used by Ehrlich, it became interesting to determine what effect formaldehyd would have upon hypersusceptibility produced by horse serum.

Normal serum+5 per cent formalin:

G. P. No. 442. Six c. c. normal horse (roan) serum+5 per cent formalin, subcutaneously. Dead, 12 minutes.

[Previous treatment: 33 days prior, 0.0006 gm. tetanus toxine A+$\frac{1}{1000}$ c. c. antitoxic horse serum (Hoechst), subcutaneously.]

G. P. No. 7542. Six c. c. same serum+5 per cent formalin; 21 hours exposure; subcutaneously. Dead, 60 minutes.

[Previous treatment: 35 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{170}$ c. c. antitoxic horse serum (Mul 2100).]

Control G. P. Six c. c. same serum+5 per cent formalin; 21 hours exposure; subcutaneously. Severe symptoms of formaldehyd poisoning.

Antitoxic serum+1 per cent formalin:

G. P. No. 7501. Six c. c. antitoxic horse serum (Natl. IX)+1 per cent formalin; 22 hours exposure; subcutaneously. Dead, 60 minutes.

[Previous treatment: 41 days prior, 0.24 c. c. toxine No. 9+$\frac{1}{350}$ c. c. antitoxic horse serum (Led 4D).]

G. P. No. 7198. Five c. c. same mixture; 4 days exposure; subcutaneously. Marked symptoms.

[Previous treatment: 59 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{120}$ c. c. antitoxic horse serum (NYBH 305).]

G. P. No. 7589. Five c. c. same mixture; 4 days exposure; subcutaneously. Mild symptoms.

[Previous treatment: 37 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{1700}$ c. c. antitoxic horse serum (Park ppt. 305–306).]

Normal serum+5 per cent formalin:

G. P. No. 7776. Six c. c. normal horse (roan) serum+5 per cent formalin; 4 hours 20 minutes exposure; subcutaneously. Mild symptoms.

[Previous treatment: 46 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{340}$ c. c. antitoxic horse serum (S 1351).]

G. P. No. 7629. Six c. c. same mixture and exposure; subcutaneously. Slight symptoms.

[Previous treatment: 64 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{350}$ c. c. antitoxic horse serum (A. ppt. 31).]

G. P. No. 7689. Six c. c. same mixture; 4 hours exposure; subcutaneously. Slight symptoms.

[Previous treatment: 56 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{350}$ c. c. antitoxic horse serum (PDCo 080235).]

While the above three pigs showed slight and mild symptoms of hypersusceptibility, they all showed severe symptoms of formaldehyd poisoning.

These results plainly show that formaldehyd, in the strength and time stated, does not apparently appreciably influence the toxicity of horse serum. We have seen before that it also has no effect upon the sensitizing action, page 12.

CALCIUM CHLORID.

Netter[a] has shown that when 1 gram of calcium chlorid is given on the day of injection and on the two following days the number of

[a] Netter, Arnold: Efficacité de l'ingestion de chlorure de calcium comme moyen préventif des éruptions consécutives aux injections de sérum. Compt. rend. soc. biol., tome 60, No. 6, Feb. 16, 1906, p. 279.

———: Influence des quantités de sérum injectées et du nombre des injections sur les éruptions sériques. Nécessité d'augmenter les quantités de sels de chaux dans les cas d'injections répétées ou supérieures à quarante centimètres cubes. Idem, p. 281.

children showing eruption following the injection of serum is greatly reduced. We thought perhaps this salt might have some influence upon the phenomenon produced in guinea pigs by two injections of horse serum. Three series of experiments were made with this object in view.

The effect of 0.1 gram of $CaCl_2$ by mouth for three consecutive days before the second injection of horse serum.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
6065	0.14 c. c. toxine 5+$\frac{1}{10}$ c. c. antitoxic horse serum (NYHD. 310), subcutaneously; then for 3 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	65	3 c. c. normal horse (roan) serum, intraperitoneally.	Marked symptoms.
6063	.....do.....	65	.....do	Dead, 40 minutes.
6064	.....do.....	65	6 c. c. normal horse (roan) serum, intraperitoneally.	Dead, 3 minutes.
6057	.....do.....	65	3 c. c. normal horse (roan) serum, intraperitoneally.	Mild symptoms.
6062	0.14 c. c. toxine 5+$\frac{1}{10}$ c. c. antitoxic horse serum (NYHD. 310), subcutaneously; then for 3 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	65	.....do	Dead, 20 minutes.

Effect of 0.1 gram $CaCl_2$ daily for twenty days before the sensitizing inoculation was given, and every other day until the second injection of horse serum, fourteen days later.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
.....	0.1 gm. $CaCl_2$ by mouth daily for 20 days; then 0.14 c. c. toxine 5+$\frac{1}{10}$ c. c. antitoxic horse serum (S. 1500), subcutaneously; then $CaCl_2$ every other day till second injection.	14	3 c. c. normal horse (roan) serum, intraperitoneally.	Dead, 30 minutes.
.....	.....do.....	14	.....do	Severe symptoms.
.....	.....do.....	14	.....do	Marked symptoms.
.....	.....do.....	14	.....do	Severe symptoms.
.....	.....do.....	14	.....do	Severe symptoms.

Effect of 0.1 gram $CaCl_2$ for fifteen consecutive days before the second injection of horse serum, 104 days after the sensitizing injection.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
5556	0.14 c. c. toxine 5+$\frac{1}{600}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	6 c. c. normal horse (roan) serum, intraperitoneally.	Dead, 35 minutes.
5550	0.14 c. c. toxine 5+$\frac{1}{300}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	.....do	Dead, 25 minutes.
5557	0.14 c. c. toxine 5+$\frac{1}{600}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	.....do	Dead, 15 minutes.
5553	0.14 c. c. toxine 5+$\frac{1}{400}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	3 c. c. normal horse (roan) serum, intraperitoneally.	Dead, 18 minutes.
5555	0.14 c. c. toxine 5+$\frac{1}{800}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	.....do	Dead, 65 minutes.
5552	0.14 c. c. toxine 5+$\frac{1}{400}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	.....do	Severe symptoms.
5551	0.14 c. c. toxine 5+$\frac{1}{800}$ c. c. antoxine horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	104	.....do	Very severe symptoms.

Effect of 0.1 gram $CaCl_2$ for fifteen consecutive days before the second injection of horse serum, 104 days after the sensitizing injection—Continued.

No. G. P.	First injection.	Interval.	Second injection.	Result.
5554	0.14 c. c. toxine 5+$\frac{1}{500}$ c. c. antitoxic horse serum (NYBH. 310), subcutaneously; then daily for 15 days before second injection, 0.1 gm. $CaCl_2$ by mouth.	*Days.* 104	6 c. c. normal horse (roan) serum, intraperitoneally.	Marked symptoms.

As will be seen from the above, the guinea pigs which received 0.1 gm. of $CaCl_2$ for three days previous to the second injection of serum reacted in the usual manner, 2 of them dying in a few minutes, and the other two had severe symptoms.

Of those which received 0.1 gm. $CaCl_2$ daily for twenty days before being given their sensitizing dose and then every other day for fourteen days before they were given the second dose of serum, none showed any marked resistance.

Of those that were sensitized first and then given 0.1 gm. $CaCl_2$ for the fourteen days previous to the second dose, 5 out of 8 died in spite of the fact that 4 received only 3 c. c. of serum.

It is, therefore, quite plain that, while $CaCl_2$ may modify the occurrence of rashes in children following a single injection of serum, it does not influence to any marked extent the toxic effect in guinea pigs of a second injection of serum given fourteen days after the first injection.

FREEZING DOES NOT DESTROY THE TOXIC PRINCIPLE.

Some normal horse serum (roan) was frozen hard at 15° F., then thawed at room temperature, and found toxic when injected into a sensitized guinea pig. For example:

No. G. P.	First injection.	Interval.	Second injection.	Result.
5329	0.22 c. c. toxine no. 7+$\frac{1}{100}$ c. c. antitoxic horse serum (Natl., XIV), subcutaneously.	*Days.* 13	6 c. c. normal horse (roan) serum, frozen hard in brine, then thawed at room temperature, intraperitoneally.	Severe symptoms.

Part III.

IS THE TOXIC PRINCIPLE SPECIFIC?

The toxic action is quantitatively specific so far as various blood serums are concerned. That is, a guinea pig sensitized with horse serum is more susceptible to a subsequent injection of horse serum than to a subsequent injection of the blood serum of cattle, sheep, cats, dogs, hogs, etc. The specific character of the hypersusceptibility is more apparent when proteid substances of quite different origin are used at the first and second injections. For example, guinea pigs sensitized with horse serum do not react at all to subsequent injections of peptone, vegetable proteid extracts, egg albumen or milk.

Horse serum versus other proteid substances.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
7030	0.142 c. c. toxine 5+ $\frac{1}{5\,0\,0}$ c. c. antitoxic horse serum (Ld. 4B), subcutaneously.	52	6 c. c. 3 per cent peptone, intraperitoneally.	No symptoms.
7039	0.142 c. c. toxine 5+ $\frac{1}{1\,0\,0\,0}$ c. c. antitoxic horse serum (Ld. 5H), subcutaneously.	52	.....do	No symptoms.
7038	0.142 c. c. toxine 5+ $\frac{1}{5\,0\,0}$ c. c. antitoxic horse serum (Ld.5H), subcutaneously.	52	6 c. c. watery extract of peas kept at 15° C. 24 hours, filtered through porcelain intraperitoneally.	No symptoms.
7033	0.142 c. c. toxine 5+ $\frac{1}{7\,5\,0}$ c. c. antitoxic horse serum (Ld. 34), subcutaneously.	52	.....do	No symptoms.
7036	0.142 c. c. toxine 5+ $\frac{1}{1\,0\,0\,0}$ c. c. antitoxic horse serum (Ld.5H), subcutaneously.	52	6 c. c. egg albumen, saturated solution in salt water (not filtered), intraperitoneally.	No symptoms.
7041	0.142 c. c. toxine 5+ $\frac{1}{7\,5\,0}$ c. c. antitoxic horse serum (Ld.5C), subcutaneously.	52	.....do	No symptoms.
7032	0.142 c. c. toxine 5+ $\frac{1}{5\,0\,0}$ c. c. antitoxic horse serum (Ld. 34), subcutaneously.	52	6 c. c. bottom milk unfiltered, intraperitoneally.	No symptoms.
7035	0.142 c. c. toxine 5+ $\frac{1}{5\,0\,0}$ c. c. antitoxic horse serum (Ld.5H), subcutaneously.	52	.....do	No symptoms.

It naturally occurred to us to determine whether guinea pigs sensitized with injections of albuminous substances, such as are contained in milk, the white of eggs, peas, etc., are sensitive to subsequent injections of horse serum.

The following experiments plainly indicate that animals sensitized with milk, egg albumen, peptone, or the albuminous substance extracted from peas, do not react when subsequently injected with horse serum.

Other proteid substances versus horse serum.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
705	0.1 c. c. fresh whole milk, subcutaneously.	31	6 c. c. normal horse (No. 15) serum, intraperitoneally.	No symptoms.
736	.....do.....	31	.....do.....	No symptoms.
738	.....do.....	31	.....do.....	No symptoms.
703	$\frac{1}{250}$ gm. peptone, subcutaneously.	31	.....do.....	No symptoms.
730	1 c. c. egg albumen in salt solution, subcutaneously.	21	.....do.....	No symptoms.
731	.....do.....	21	.....do.....	No symptoms.
742	1 c. c. watery extract peas, subcutaneously.	21	10 c. c. normal horse (No. 15) serum, intraperitoneally.	No symptoms.
743	0.5 c. c. watery extract peas, subcutaneously.	21	.....do.....	No symptoms.
744	0.1 c. c. watery extract peas, subcutaneously.	21	.....do.....	No symptoms.
484	1 c. c. normal horse (roan) serum, subcutaneously.	64	6 c. c. hemoglobin, horse (roan), intraperitoneally.	Mild symptoms.
485	6 c. c. normal horse (roan) serum, subcutaneously.	64	.....do.....	Mild symptoms.
486	.....do.....	64	.....do.....	Slight symptoms.
487	$\frac{1}{250}$ c. c. normal horse (roan) serum, subcutaneously.	64	.....do.....	Slight symptoms.

Part IV.

OTHER BLOOD SERUMS AND OTHER ALBUMINOUS SUBSTANCES ARE ALSO TOXIC.

So much of our work has been done with horse serum that we desire to record some further experiments with the blood serums of other animals. We confirm and extend our previous work that the same reactions may be induced in the guinea pig with the blood serums of various animals, such as the dog, ox, sheep, cat, and hog.

Other blood serums.

No. G. P.	First injection.	Interval.	Second injection.	Result.
	Subcutaneously, $\frac{1}{250}$ c. c. serum of—	*Days.*	Intraperitoneally, 6 c. c. serum of—	
461	Ox	37	Ox	Dead, 120 minutes.
462	do	37	do	Marked symptoms.
463	do	37	do	Severe symptoms.
465	do	37	do	Severe symptoms.
466	Sheep	37	Sheep	Slight symptoms.
467	do	37	do	Dead, 110 minutes.
468	do	37	do	Severe symptoms.
469	do	37	do	Severe symptoms.
470	do	37	do	Dead, 12 hours.
471	Hog	37	Hog	Mild symptoms.
472	do	37	do	Dead, 12 hours.
473	do	37	do	Dead, 1 hour.
474	do	37	do	Severe symptoms.
475	do	37	do	Severe symptoms.
476	Dog	70	Dog	Dead, 60 minutes.
477	do	70	do	Dead, 120 minutes.
478	do	70	do	Dead, 20 minutes.
479	do	70	do	Dead, 65 minutes.
480	do	70	do	Dead, 70 minutes.
481	Cat	70	Cat	Dead, 120 minutes.
482	do	70	do	Dead, 50 minutes.
483	do	70	do	Dead, 120 minutes.
484	do	70	do	Dead, 50 minutes.
485	do	70	do	Dead, 65 minutes.

OTHER ALBUMINOUS SUBSTANCES.

As soon as we concluded that it is probably the proteid substance in horse serum that is chiefly concerned in sensitizing and poisoning the guinea pigs, we thought of other proteid substances obtained from widely different sources.

We have found that hemoglobin, egg albumen, milk, and extract of peas are quite as active as horse serum. Peptone seems to have slight sensitizing and poisonous properties; leucin and tyrosin none at all. The reaction following the second injection of proteid matter in the guinea pigs appears, then, to be common to all the higher forms of albuminous substances, no matter from what source. It occurs to us that this phenomenon of hypersusceptibility in the guinea pig may be used as a physiological test to distinguish true proteid substances from the lower forms of nitrogenous compounds. It would

be interesting to determine whether the synthetic peptids and polypeptids of Fisher sufficiently approach the true proteid molecular structure to induce hypersusceptibility in the guinea pig.

From our work with other proteid substances it was but a logical step to the albuminous content of the bacterial cell, which is dealt with in another part of this work.

Hemoglobin versus hemoglobin.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
411	0.1 c. c. hemoglobin (washed 20 times) subcutaneously.	22	6 c. c. hemoglobin, intraperitoneally.	Marked symptoms.
412	0.5 c. c. hemoglobin (washed 20 times) subcutaneously.	22	.....do	Severe symptoms.
413	1 c. c. hemoglobin (washed 20 times) subcutaneously.	22	.....do	Dead, 5 minutes.
414	3 c. c. hemoglobin (washed 20 times) subcutaneously.	22	.....do	Slight symptoms.
415	5 c. c. hemoglobin (washed 20 times) subcutaneously.	22	.....do	Very severe symptoms.

The hemoglobin was obtained by dissolving the washed red corpuscles of a normal horse in distilled water. The red corpuscles for the hemoglobin solution used at the first injection, in order to sensitize the guinea pigs, was washed and centrifuged 20 times in order to surely wash away all traces of serum, the smallest remaining quantities of which might have confused the results. The hemoglobin used at the second injection was dissolved from red corpuscles washed four times.

Egg albumen versus egg albumen.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
406	0.1 c. c. egg albumen, subcutaneously.	22	6 c. c. saturated solution of egg albumen in salt solution, intraperitoneally.	Dead, 30 minutes.
407	0.5 c. c. egg albumen, subcutaneously.	22	.....do	Dead, 18 minutes.
408	1 c. c. egg albumen, subcutaneously.	22	.....do	Dead, 25 minutes.
409	3 c. c. egg albumen, subcutaneously.	22	.....do	Dead, 25 minutes.
410	5 c. c. egg albumen, subcutaneously.	22	.....do	Dead, 20 minutes.
732	1 c. c. egg albumen + salt solution, subcutaneously.	21	6 c. c. egg albumen + salt solution equal quantities, intraperitoneally.	Severe symptoms.

Milk versus milk.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
401	3 c. c. milk filtered through porcelain, subcutaneously.	26	10 c. c. bottom milk, intraperitoneally.	Slight symptoms.
402	1 c. c. milk filtered through porcelain, subcutaneously.	26	.....do	Slight symptoms.
403	0.5 c. c. milk filtered through porcelain, subcutaneously.	26	.....do	Slight symptoms.
404	0.1 c. c. milk filtered through porcelain, subcutaneously.	26	.....do	Slight symptoms.
706	0.5 c. c. fresh whole milk, subcutaneously.	31	10 c. c. fresh whole milk, intraperitoneally.	Dead, 20 minutes.
707	1 c. c. fresh whole milk, subcutaneously.	31	.....do	Very severe symptoms.
708	3 c. c. fresh whole milk, subcutaneously.	31	.....do	Very severe symptoms.
709	5 c. c. fresh whole milk, subcutaneously.	31	.....do	Very severe symptoms.
737	0.1 c.c. fresh whole milk, subcutaneously.	31	.....do	Very severe symptoms.
Control: 6 c. c. fresh whole milk, intraperitoneally.....				No symptoms.

Peas versus peas.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
416	0.1 c. c. watery extract peas, 24 hours at 15° C. (acid), filtered through porcelain, subcutaneously.	26	10 c. c. watery extract of peas, 3 days at 15° C., filtered through porcelain intraperitoneally.	Marked symptoms.
417	0.5 c. c. watery extract peas, 24 hours at 15° C. (acid), filtered through porcelain, subcutaneously.	26	.....do	Dead, 7 hours and 30 minutes.
418	1 c. c. watery extract peas, 24 hours at 15° C. (acid), filtered through porcelain, subcutaneously.	26	.....do	Marked symptoms.
419	3 c. c. watery extract peas, 24 hours at 15° C. (acid), filtered through porcelain, subcutaneously.	26	.....do	Dead, 4 hours.
420	5 c. c. watery extract peas, 24 hours at 15° C. (acid), filtered through porcelain, subcutaneously.	26	.....do	Dead, 2 hours.
Control: 10 c. c. watery extract of peas, 3 days at 15° C., filtered through porcelain, intraperitoneally.				No symptoms.
Do.....				No symptoms.

Peptone versus peptone.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
492	0.5 c. c. half-saturated solution peptone, subcutaneously.	21	6 c. c. saturated solution of peptone, intraperitoneally.	Slight symptoms.
490	1 c. c. half-saturated solution peptone, subcutaneously.	21	.....do	Mild symptoms.
491	3 c. c. half-saturated solution peptone, subcutaneously.	21	.....do	Marked symptoms.
488	0.1 c. c. half-saturated solution peptone, subcutaneously.	21	.....do	Marked symptoms.
748	0.1 c. c. heated, half-saturated solution peptone, subcutaneously.	21	6 c. c. half-saturated solution of peptone, intraperitoneally.	Marked symptoms.
749	0.5 c. c. heated, half-saturated solution peptone, subcutaneously.	21	.....do	No symptoms.
750	1 c. c. heated, half-saturated solution peptone, subcutaneously.	21	.....do	Marked symptoms.
751	3 c. c. heated, half-saturated solution, peptone, subcutaneously.	21	6 c. c. half-saturated solution of peptone, intraperitoneally.	Marked symptoms.
752	5 c. c. heated, half-saturated solution peptone, subcutaneously.	21	6 c. c. half-saturated solution of peptone, subcutaneously.	Marked symptoms.
Control: 6 c. c. half-saturated solution of peptone, heated, subcutaneously.				No symptoms.

Tyrosin versus tyrosin.

No. G. P.	First injection.	Interval.	Second injection.	Results.
		Days.		
739	0.002 gm. watery solution of tyrosin, subcutaneously.	21	6 c. c. tyrosin (0.1 gm. + 50 c. c.) watery solution, intraperitoneally.	No symptoms.
740	0.01 gm. watery solution of tyrosin, subcutaneously.	21	20 c. c. tyrosin (0.1 gm. + 50 c. c.) watery solution, intraperitoneally.	No symptoms.
741	0.02 gm. watery solution of tyrosin, subcutaneously.	21	10 c. c. tyrosin (0.1 gm. + 50 c. c.) watery solution, intraperitoneally.	No symptoms.
Control: 6 c. c. tyrosin (0.1 gm. + 50 c. c.) watery solution, intraperitoneally, into a fresh guinea pig.				No symptoms.

Leucin versus leucin.

No. G. P.	First injection.	Interval.	Second injection.	Results.
		Days.		
745	0.02 gm. leucin in watery solution, subcutaneously.	17	20 c. c. (0.2 gm. + 50 c. c.) watery solution intraperitoneally.	No symptoms.
746	0.02 gm. leucin in watery solution, subcutaneously.	17	6 c. c. (0.2 gm. + 50 c. c.) watery solution intraperitoneally.	No symptoms.
747	0.02 gm. leucin in watery solution, subcutaneously.	17	10 c. c. (0.2 gm. + 50 c. c.) watery solution intraperitoneally.	No symptoms.
Control: 6 c. c. leucin (0.2 gm. + 50 c. c.) watery solution, intraperitoneally, into a fresh guinea pig.				No symptoms.

Part V.

HYPERSUSCEPTIBILITY AND IMMUNITY PRODUCED BY BACTERIAL PROTEIDS.

Experimental studies with the bacterial proteids are of the greatest importance on account of the practical uses to which results along this line may lead. Our conviction that the phenomenon of hypersusceptibility which we have been studying in the guinea pig has a deep significance in general pathology, especially in the problem of immunity, induced us to undertake an extensive series of experiments with proteid extracts obtained from bacterial cell masses. Some of this work is sufficiently advanced for us to record our results in part.

Hypersusceptibility may easily be induced in guinea pigs with proteid extracts obtained from the bacterial cell. The first injection of most of the extracts used by us seems comparatively harmless to the animal. A second injection of the same extract shows, however, that profound physiological changes have taken place. A definite period must elapse between the first and the second injection. The symptoms presented by the guinea pigs as a result of the second injection resemble those caused by horse serum.

The phenomenon induced by a second injection is followed (in certain cases) by an immunity to the corresponding infection.

These results strengthen our belief that the phenomenon of hypersusceptibility has a practical significance in the prevention and cure of certain infectious processes. It gives a possible explanation to the period of incubation of some of the communicable diseases. Is it a coincidence that the period of incubation of a number of infectious diseases is about ten to fourteen days, which corresponds significantly with the time required to sensitize animals with a strange proteid? In certain infectious diseases with short periods of incubation, such as pneumonia, the crisis which commonly appears about the tenth day may find a somewhat similar explanation. It is evident that disease processes produced by soluble toxines, such as diphtheria and tetanus, do not belong to the category now under consideration.

EXTRACT OF COLON BACILLUS.

The extract from the colon bacillus in the following experiments was obtained as follows:

A 2-day-old culture of *B. coli communis* in Dunham's solution was used to heavily inoculate the surface of 84 large agar plates. These

plates were grown at 37° C. for four days and the surface growth collected.

The bacterial mass was frozen forty-eight hours at about 15° F., thawed at room temperature, and then ground with sand by hand in a mortar and pestle for five hours, shaken vigorously half an hour, and again frozen eighteen hours. After again thawing, the fluid was diluted with salt solution and filtered through a Berkefeld filter. The clear filtrate gave a distinct coagulum with heat and acetic acid.

All the other extracts were obtained by a similar process. In the case of the tubercle bacillus the bacterial mass was first washed three days in running water to eliminate the soluble tuberculin as much as possible.

B. coli.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
817	5 c. c. colon extract, subcutaneously.	35	6 c. c. colon extract, intraperitoneally.	Marked symptoms.
819	1 c. c. colon extract, subcutaneously.	35	.....do	Mild symptoms.
818	.....do	35	6 c. c. colon extract, subcutaneously.	Marked symptoms
820	.....do	35	.....do	Slight symptoms.
821	.....do	35	6 c. c. colon extract, intraperitoneally.	Mild symptoms.
822	0.5 c. c. colon extract, subcutaneously.	35	6 c. c. colon extract, subcutaneously.	Mild symptoms.
823	0.1 c. c. colon extract, subcutaneously.	35	6 c. c. colon extract, intraperitoneally.	Slight symptoms.
824	0.01 c. c. colon extract, subcutaneously.	35	6 c. c. colon extract, subcutaneously.	Marked symptoms.
825	0.005 c. c. colon extract, subcutaneously.	35	6 c. c. colon extract, intraperitoneally.	Severe symptoms.

The hypersusceptibility induced by the colon extracts manifested itself by symptoms resembling those already described in the case of horse serum. The guinea pigs scratched at the mouth with their hind legs. Most of them showed evidences of respiratory embarrassment by quickened, labored, or irregular breathing. Many of the pigs lay over on their sides, which is a very common symptom. A few developed jerky movements, but in no case was convulsion noted. The pigs looked quite sick and ill at ease, but gradually recovered, so that by next morning they seemed normal.

Ten days following the second injection of the extract all the above pigs were given 5 c. c. of a heavy emulsion of colon bacillus from 24-hour old agar slants, but showed no symptoms, and remain in good condition. Three controls received the same injection and died in twelve hours.

YEAST.

The manifestations of hypersusceptibility produced by the proteid extract from yeast cells are restlessness, scratching, irregular respirations; the guinea pigs lie down and look sick; sometimes jerky movements are seen and, in one instance, convulsions.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
755	1 c. c. extract yeast cells, subcutaneously.	22	6 c. c. extract yeast cells, intraperitoneally.	Very severe symptoms.
754	0.5 c. c. extract yeast cells, subcutaneously.	22	6 c. c. extract yeast cells, subcutaneously.	Slight symptoms.
864	0.1 c. c. extract yeast cells, subcutaneously.	19	5 c. c. extract yeast cells, subcutaneously.	Slight symptoms.
803	1 c. c. extract yeast cells, subcutaneously.	27	6 c. c. extract yeast cells, intraperitoneally.	Mild symptoms.
807	.....do.....	27	.....do.....	Mild symptoms.
804	.....do.....	27	.....do.....	Marked symptoms.
809	.....do.....	27	.....do.....	Dead, 2 hours 10 minutes.
802	.....do.....	27	6 c. c. extract yeast cells, subcutaneously.	Slight symptoms.
805	.....do.....	27	.....do.....	Slight symptoms.
810	.....do.....	27	.....do.....	Marked symptoms.
806	.....do.....	27	.....do.....	Very severe symptoms.
815	0.005 c. c. extract yeast cells, subcutaneously.	27	5 c. c. extract yeast cells, subcutaneously.	No symptoms.
814	0.01 c. c. extract yeast cells, subcutaneously.	27	.....do.....	Slight symptoms.
813	0.02 c. c. extract yeast cells, subcutaneously.	27	.....do.....	Mild symptoms.
812	0.1 c. c. extract yeast cells, subcutaneously.	27	.....do.....	Severe symptoms.
811	0.5 c. c. extract yeast cells, subcutaneously.	27	.....do.....	Very severe symptoms.
801	5 c. c. extract yeast cells, subcutaneously.	27	.....do.....	Mild symptoms.
800	10 c. c. extract yeast cells, subcutaneously.	27	.....do.....	Very severe symptoms.

HAY BACILLUS.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
869	1 c. c. extract subtilis, subcutaneously.	14	7 c. c. extract subtilis, intraperitoneally.	Slight symptoms.
864	10 c. c. extract subtilis, subcutaneously.	25	6 c. c. extract subtilis, intraperitoneally.	Marked symptoms.

HAY BACILLUS—Continued.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
865	8 c. c. extract subtilis, subcutaneously.	25	6 c. c. extract subtilis, intraperitoneally.	No symptoms.
866	6 c. c. extract subtilis, subcutaneously.	25	.....do	Marked symptoms.
868	2 c. c. extract subtilis, subcutaneously.	25	.....do	Marked symptoms.
870	0.5 c. c. extract subtilis, subcutaneously.	25	.....do	Marked symptoms.
871	0.1 c. c. extract subtilis, subcutaneously.	25	.....do	Slight symptoms.
872	0.01 c. c. extract subtilis, subcutaneously.	25	.....do	Slight symptoms.
873	0.001 c. c. extract subtilis, subcutaneously.	25	.....do	Slight symptoms.

ANTHRAX.

Indications of hypersusceptibility produced by anthrax are scratching, rapid respirations; pigs frequently fall over on their sides and look sick. None of the pigs coughed or had convulsions.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
842	10 c. c. extract of anthrax, subcutaneously.	21	6 c. c. extract anthrax, subcutaneously.	Marked symptoms.
843	5 c. c. extract of anthrax, subcutaneously.	21	.....do	Mild symptoms.
844	1 c. c. extract of anthrax, subcutaneously.	21	.....do	Mild symptoms.
845	.....do	21	.....do	Slight symptoms.
846	.....do	21	.....do	Severe symptoms.
847	.....do	21	.....do	Mild symptoms.
848	0.5 c. c. extract of anthrax, subcutaneously.	21	.....do	Mild symptoms.
849	0.1 c. c. extract of anthrax, subcutaneously.	21	.....do	Slight symptoms.
850	0.01 c. c. extract of anthrax, subcutaneously.	21	.....do	Slight symptoms.
851	0.005 c. c. extract of anthrax, subcutaneously.	21	.....do	Slight symptoms.
852	1 c. c. extract of anthrax, subcutaneously, daily 7 days.	11	.....do	No symptoms.
853	.....do	11	.....do	No symptoms.
854	.....do	11	4 c. c. extract anthrax, subcutaneously.	Mild symptoms.
855	.....do	11	6 c. c. extract anthrax, subcutaneously.	Slight symptoms.
856	.....do	11	.....do	No symptoms.

All the above guinea pigs were subsequently inoculated with a virulent culture of anthrax. They all died in a few days with the usual lesions.

A number of guinea pigs were given the extract from anthrax bacilli before infection; some were given a single injection, some two injections, and others daily injections for twenty days. Other guinea pigs were given the extract used as a vaccine, both in single and repeated injections, after being infected with anthrax bacilli. The extract did not seem to have any influence on the course of the disease, whether given before or after the infection.

TUBERCULOSIS.

The indications of hypersusceptibility induced by extract of tubercle bacilli are restlessness, scratching, irregular respiration, tremor; most of the pigs lie down on their sides and look sick.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
827	0.1 c. c. extract human tubercle bacilli, subcutaneously.	32	6 c. c. extract human tubercle bacilli, subcutaneously.	Mild symptoms.
828	1 c. c. extract human tubercle bacilli, subcutaneously.	32	.....do	No symptoms.
829	2 c. c. extract human tubercle bacilli, subcutaneously.	32	.....do	Mild symptoms.
830	3 c. c. extract human tubercle bacilli, subcutaneously.	32	.....do	Mild symptoms.
831	4 c. c. extract human tubercle bacilli, subcutaneously.	32	.....do	Mild symptoms.
832	5 c. c. extract human tubercle bacilli, subcutaneously.	32	6 c. c. extract human tubercle bacilli, intraperitoneally.	Severe symptoms.
833	6 c. c. extract human tubercle bacilli, subcutaneously.	32	.....do	Slight symptoms.
834	7 c. c. extract human tubercle bacilli, subcutaneously.	32	10 c. c. extract human tubercle bacilli, intraperitoneally.	Slight symptoms.
835	8 c. c. extract human tubercle bacilli, subcutaneously.	32	6 c. c. extract human tubercle bacilli, intraperitoneally.	Mild symptoms.
836	9 c. c. extract human tubercle bacilli, subcutaneously.	32	6 c. c. extract human tubercle bacilli, subcutaneously.	No symptoms.

The guinea pigs which have reacted to two injections of proteid extract obtained from the tubercle bacillus are now being tested for immunity to infection with tubercle cultures.

TYPHOID.

The indications of hypersusceptibility induced by two injections of typhoid extract manifest themselves by rapid respirations; most of the pigs lie down on their sides. The symptoms presented by this series of pigs were mild.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
857	10 c. c. typhoid extract, subcutaneously.	34	10 c. c. typhoid extract, subcutaneously.	Slight symptoms.
858	5 c. c. typhoid extract, subcutaneously.	34	.....do	Slight symptoms.
859	1 c. c. typhoid extract, subcutaneously.	34	.....do	Slight symptoms.
860	.....do	34	6 c. c. typhoid extract, intraperitoneally.	Slight symptoms.
862	0.5 c. c. typhoid extract, subcutaneously.	34	10 c. c. typhoid extract, subcutaneously.	Slight symptoms.
863	0.1 c. c. typhoid extract, subcutaneously.	34	.....do	Slight symptoms.

Nine days following the second injection of the extract, five pigs of the above series, which had received 10 c. c. of the typhoid extract at the second injection, resisted a large dose of a virulent typhoid culture. Two controls died in eighteen hours. One or two of the pigs which had received the extract were slightly sick the following day, but the next day had fully recovered and have remained so. A definite immunity was, therefore, conferred by the two injections of extract from the typhoid bacillus.

TYPHO-LYSIN.

Along somewhat the same lines efforts to obtain the phenomenon of hypersusceptibility with the dissolved typhoid bacilli (natural lysis) failed.

G. P. 480W and 550W:

September 11 to 20, fed dead typhoid culture daily.

September 26 to 28, fed live typhoid culture daily.

December 14 to 28, 1 c.c. bouillon culture of typhoid daily, subcutaneously.

January 15, 10 c.c. heavy old bouillon culture of typhoid, intraperitoneally. Killed 1 hour later. Peritoneal contents collected. Then peritoneal cavity washed with salt solution.

G. P. 100T and 109T:

September 11 to 20, fed dead typhoid bacilli daily.

September 28 to November 9, fed live typhoid bacilli daily.

December 17 to 28, 1 c.c. bouillon culture of typhoid daily, subcutaneously.

February 19, 6 c.c. heavy old bouillon culture of typhoid, intraperitoneally. Killed 1 hour later. Peritoneal contents collected. Then peritoneal cavity washed with salt solution.

Peritoneal contents and saline washings from the peritoneal cavities of the above pigs used as follows:

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
114	0.5 c. c. peritoneal contents of G. P. 480 and 550 containing dissolved typhoid bacilli, subcutaneously.	35	6 c. c. saline washings from peritoneal cavities of 10 pigs (100T to 109T) containing dissolved typhoid bacilli intraperitoneally.	No symptoms.
115	0.75 c. c. peritoneal contents of G. P. 480 and 550 containing dissolved typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
116	.....do	35	.....do	No symptoms.
117	2 c. c. peritoneal contents of G. P. 480 and 550 containing dissolved typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
118	0.5 c. c. saline washings from peritoneal cavities of G. P. 480 and 550, containing dissolved typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
119	1 c. c. saline washings from peritoneal cavities of G. P. 480 and 550, containing dissolved typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
120	1.5 c. c. saline washings from peritoneal cavities of G. P. 480 and 550, containing dissolved typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
121	6 c. c. saline washings from peritoneal cavities of G. P. 480 and 550, containing dissolved typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
111T	0.5 c. c. bouillon culture of typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
112T	1 c. c. bouillon culture of typhoid bacilli, subcutaneously.	35	.....do	No symptoms.
113T	.....do	35	.....do	No symptoms.

Part VI.

COMPARATIVE TOXICITY OF UNTREATED AND REFINED ANTITOXIC SERUM.

It has long been known that diphtheria antitoxin is precipitated from the serum with the globulins, and many attempts have been made to separate the antitoxin from the nonantitoxic substances contained in the serum.

Gibson[a] has evolved a practical method of concentrating and refining diphtheria antitoxic serum. Part of the process consists in placing the one-half saturation of ammonium sulphate precipitate derived from the antitoxic serum in saturated sodium chlorid solution. This dissolves a portion of the globulins with all the antitoxin. In this way the nucleoproteids and insoluble globulins present in the first precipitate are eliminated. The soluble globulins are precipitated by acetic acid, filtered, partially dried, and finally placed in a sack of parchment membrane and dialyzed in running water. This antitoxic solution of soluble globulins is then rendered neutral and sufficient sodium chlorid added to make it isotonic.

Park and Throne[b] find, from a comparative study of 100 cases, that the removal of a considerable portion of the non-antitoxic globulins from the serum by the Gibson method eliminates much of the deleterious matter from the serum, so that severe rashes, joint complications, fever, and other constitutional disturbances are less likely to occur from the antitoxic globulins than from the antitoxic serum from which they were obtained.

We asked ourselves the question whether the precipitated and refined serum is less toxic to sensitized guinea pigs than the untreated serum from which it was made. Doctor Park kindly furnished us some of the precipitated serum and the corresponding untreated serum from which it was made in order to carry out these tests.

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[a] Gibson, R. B. Journ. biolog. chemistry Vol. 1, Nos. 2 and 3, 1906.

[b] Park, William H., and Throne, Binford: The results of the use of "refined diphtheria antitoxin," Gibson's "globulin preparation," in the treatment of diphtheria. Trans. Assn. Am. Physicians, Vol. 21, 1906, pp. 259–267.

Comparative toxicity of untreated and refined antitoxic serum.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
7491	0.24 c. c. toxine 9+$\frac{1}{18}$ c. c. antitoxic horse serum (PD. 08004), subcutaneously.	25	1 c. c. antitoxic horse serum, Gibson precipitated (NYBH. 305–6), intraperitoneally.	Dead, 25 minutes.
7480	0.24 c. c. toxine 9+$\frac{1}{32}$ c. c. antitoxic horse serum (S. 68D), subcutaneously.	25	.....do	Dead, 30 minutes.
7493	0.24 c. c. toxine 9+$\frac{1}{36}$ c. c. antitoxic horse serum (PD. 08516), subcutaneously.	25	.....do	Dead, 40 minutes.
7489	0.24 c. c. toxine 9+$\frac{1}{12}$ c. c. antitoxic horse serum (PD. 08004), subcutaneously.	25	.....do	Dead, 42 minutes.
7478	0.24 c. c. toxine 9+$\frac{1}{18}$ c. c. antitoxic horse serum (S. 69II), subcutaneously.	25	1 c. c. antitoxic horse serum (NYBH. 305–6), untreated.	Dead, 12 minutes.
7490	0.24 c. c. toxine 9+$\frac{1}{18}$ c. c. antitoxic horse serum (PD. 08004), subcutaneously.	25	.....do	Very severe symptoms.
7477	0.24 c. c. toxine 9+$\frac{1}{18}$ c. c. antitoxic horse serum (S. 69II), subcutaneously.	25	.....do	Very severe symptoms.
7505	0.24 c. c. toxine 9+$\frac{1}{18}$ c. c. antitoxic horse serum (Hb. 27), subcutaneously.	25	2 c. c. antitoxic horse serum, Gibson precipitated (NYBH. 305–6), subcutaneously.	Marked symptoms.
7503	0.24 c. c. toxine 9+$\frac{1}{36}$ c. c. antitoxic horse serum (Hb. 27), subcutaneously.	25	.....do	Severe symptoms.
7502	0.24 c. c. toxine 9+$\frac{1}{24}$ c. c. antitoxic horse serum (Hb. 26), subcutaneously.	25	.....do	Marked symptoms.
7504	0.24 c. c. toxine 9+$\frac{1}{24}$ c. c. antitoxic horse serum (Hb. 26), subcutaneously.	25	2 c. c. antitoxic horse serum (NYBH. 305–6), untreated.	Marked symptoms.
7506	0.24 c. c. toxine 9+$\frac{1}{32}$ c. c. antitoxic horse serum (Hb. 27), subcutaneously.	25	.....do	Severe symptoms.
7507	0.24 c. c. toxine 9+$\frac{1}{32}$ c. c. antitoxic horse serum (Hb. 27), subcutaneously.	25	.....do	Severe symptoms.

Comparative toxicity of untreated and refined antitoxic serum.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
7195	0.142 c. c. toxine 5+$\frac{1}{500}$ c. c. antitoxic horse serum (NYBH. 305), subcutaneously.	41	1 c. c. antitoxic horse serum, Gibson precipitated (NYBH. 305–6), subcutaneously.	Severe symptoms.
7190	0.142 c. c. toxine 5+$\frac{1}{1000}$ c. c. antitoxic horse serum (NYBH. 305), subcutaneously.	41	.....do	Severe symptoms.
7194	0.142 c. c. toxine 5+$\frac{1}{500}$ c. c. antitoxic horse serum (NYBH. 305), subcutaneously.	41	.....do	Very severe symptoms.
7189	0.142 c. c. toxine 5+$\frac{1}{1000}$ c. c. antitoxic horse serum (NYBH. 305), subcutaneously.	41	1 c. c. antitoxic horse serum (NYBH. 305–6), untreated.	Very severe symptoms.
7193	0.142 c. c. toxine 5+$\frac{1}{500}$ c. c. antitoxic horse serum (NYBH. 305), subcutaneously.	41	.....do	Very severe symptoms.
7196	0.142 c. c. toxine 5+$\frac{1}{500}$ c. c. antitoxic horse serum (NYBH. 305), subcutaneously.	41	.....do	Very severe symptoms.

We think it evident from the above that refined antitoxic serum precipitated and dialyzed in accordance with the Gibson method is quite as toxic, bulk for bulk, as the untreated serum from which it has been obtained. We must, however, consider that the treatment to which the serum is subjected in accordance with the Gibson method concentrates its antitoxic power about twice. There is, therefore, a distinct advantage gained, so far as bulk is concerned, in giving a corresponding number of antitoxic units; for, the serum reaction in children depends partly upon the quantity of serum given.

Part VII.

COMPARATIVE TOXICITY OF DIFFERENT HORSE SERUMS.

Besredka and Steinhardt[a] believe that the French horse serums are much less toxic than those used by Otto[b] and the serums used by us. Besredka and Steinhardt had a mortality of about 25 per cent when 5 c. c. of serum was injected intraperitoneally at the second injection, whereas Otto's and our percentage under similar conditions was much higher. Besredka kindly sent us a quantity of "serum antidiphterique" prepared at the Pasteur Institute and this serum was injected into a series of guinea pigs in order to compare its toxicity with the normal horse serum of our roan horse that we have used so much in these experiments.

Toxicity of "serum antidiphterique" (Pasteur Institute).

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
7768	0.142 c. c. toxine 5+$\frac{1}{320}$ c. c. antitoxic horse serum (S. spl. 1351), subcutaneously.	76	5 c. c. antitoxic horse serum (Pasteur Institute), intraperitoneally.	Dead, 11 minutes.
7774	0.142 c. c. toxine 5+$\frac{1}{320}$ c. c. antitoxic horse serum (S. spl. 1351), subcutaneously.	76	.....do	Dead, 10 minutes.
7723	0.142 c. c. toxine 5+$\frac{1}{320}$ c. c. antitoxic horse serum (PD. 08022), subcutaneously.	83	.....do	Dead, 15 minutes.
7726	0.142 c. c. toxine 5+$\frac{1}{320}$ c. c. antitoxic horse serum (PD. 08022), subcutaneously.	83	.....do	Dead, 9 minutes.
7849	0.142 c. c. toxine 5+$\frac{1}{250}$ c. c. antitoxic horse serum (A. 192), subcutaneously.	58	.....do	Dead, 19 minutes.
440	0.0006 gm. tetanus toxine A+$\frac{1}{100}$ c. c. antitoxic horse serum (Hoechst), subcutaneously.	56	.....do	Dead, 10 minutes.
451	0.0006 gm. tetanus toxine A+$\frac{1}{100}$ c. c. antitoxic horse serum (Parke), subcutaneously.	56	.....do	Dead, 10 minutes.

[a] Besredka, A., and Steinhardt, Edna: De l'anaphylaxie et de l'anti-anaphylaxie vis-à-vis du sérum de cheval. Ann. de l'Inst. Pasteur, Vol. 21, No. 2, Feb. 25, 1907, pp. 117–127.

[b] Otto, R.: Das Theobald Smithschen Phänomen der Serum-Ueberempfindlichkeit. Leuthold-Gedenkschr., Bd. 1, 1905.

Toxicity of normal horse serum (our roan).

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
7845	0.24 c. c. toxine 9+$\frac{1}{3}\frac{1}{0}$ c. c. antitoxic horse serum (A. 192), subcutaneously.	58	5 c. c. normal horse (roan) serum intraperitoneally.	Dead, 20 minutes.
7850	0.24 c. c. toxine 9+$\frac{1}{2}\frac{1}{0}$ c. c. antitoxic horse serum (A. 142), subcutaneously.	58	.....do	Dead, 18 minutes.
7725	0.24 c. c. toxine 9+$\frac{1}{3}\frac{1}{0}$ c. c. antitoxic horse serum (PD. 08022), subcutaneously.	80	.....do	Dead, 35 minutes.
444	0.0006 gm. tetanus toxine A+$\frac{1}{1}\frac{1}{2}\frac{1}{0}\frac{1}{0}$ c. c. antitoxic horse serum (Hoechst), subcutaneously.	56	.....do	Very severe symptoms.
447	0.0006 gm. tetanus toxine A+$\frac{1}{5}\frac{1}{0}\frac{1}{0}$ c. c. antitoxic horse serum (M. 2122), subcutaneously.	56	.....do	Very severe symptoms.

It is perfectly evident from the above that our results upon the comparative toxicity of the French and American serums do not agree with those reported by Besredka and Steinhardt. With us, the French serums are perhaps somewhat more toxic than our own. We believe these contradictory results are due to other causes than the relative toxicity of the different serums. It is not likely that these differences are due to varying susceptibility of the different breeds of guinea pigs. We have found little difference between guinea pigs obtained from five or six different sources. Further, we have sometimes been struck with the fact that guinea pigs from our own stock and raised under precisely similar conditions show striking differences of degree in the reaction to the second injection. For instance, all the guinea pigs sensitized with toxine-antitoxin mixtures upon a certain date will subsequently prove exceedingly sensitive, and most of them will die at the second injection, whereas another lot of guinea pigs similarly sensitized at another time will prove much less susceptible at the second injection. So far as we are able to judge, this difference of toxicity depends upon something connected with the sensitizing action and not with the variety of horse serum given at the second injection.

NOTE.—When *toxine* is mentioned in the tables diphtheria toxine is meant unless otherwise stated.

Part VIII.

THE IMMUNITY TO HYPERSUSCEPTIBILITY OR "ANTI-ANAPHYLAXIS."

The immunity produced against the toxic action by repeated injections of horse serum has been called anti-anaphylaxis by Besredka and Steinhardt.[a] From our subsequent work we learn that this immunity is relatively not quite as lasting and definite as many instances of active immunity seen in the laboratory against bacterial infections. Guinea pigs that have received a number of prior injections of horse serum may again show symptoms when reinjected with large amounts. The symptoms in such cases are usually mild, and death has never occurred in an "immunized" guinea pig as a result of subsequent injections with horse serum.

G. P. No. 410:

January 15, 1906, 1 c. c. antitoxic horse serum (Natl. VIII, 17), subcutaneously. No symptoms.

January 23, 1906, 1 c. c. antitoxic horse serum (Natl. VIII, 17), subcutaneously. No symptoms.

February 8, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 17), subcutaneously. No symptoms.

February 14, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 17), subcutaneously. No symptoms.

February 23, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 17), subcutaneously. No symptoms.

March 29, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 18), subcutaneously. No symptoms.

April 18, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 19), subcutaneously. No symptoms.

May 16, 1906, 6 c. c. normal horse (roan) serum, subcutaneously. No symptoms.

May 18 to June 27, 1906, normal horse (roan) serum, 1 c. c. daily, subcutaneously. No symptoms.

September 7, 1906, 6 c. c. normal horse (roan) serum, intraperitoneally. No symptoms.

G. P. No. 430:

May 18 to June 27, 1906, 1 c. c. normal horse (roan) serum, daily, subcutaneously. No symptoms.

February 27, 1907, 6 c. c. normal horse (roan) serum, intraperitoneally. Severe symptoms.

G. P. No. 427:

May 18 to June 27, 1906, 1 c. c. normal horse (roan) serum, daily, subcutaneously. No symptoms.

February 27, 1907, 6 c. c. normal horse (roan) serum, intraperitoneally. Severe symptoms.

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[a] Ann. de l'Inst. Pasteur, Vol. 21, No. 2, Feb. 25, 1907, pp. 117–127.

G. P. No. 4426:

January 10, 1906, 0.002 c. c. toxine No. 5, subcutaneously.

January 18, 1906, 6 c. c. normal horse (No. 15) serum, intraperitoneally. No symptom.

February 14, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 17), intraperitoneally. Symptoms (?).

February 23, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 17), intraperitoneally. No symptoms.

March 20, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 17), intraperitoneally. Mild symptoms.

April 18, 1906, 6 c. c. antitoxic horse serum (Natl. VIII, 18), intraperitoneally. No symptoms.

May 16, 1906, 6 c. c. normal horse (roan) serum, intraperitoneally. Severe symptoms.

May 18 to June 27, 1906, 1 c. c. normal horse (roan) serum, intraperitoneally, daily, except Sunday; 22 injections. No symptoms.

January 25, 1907, 6 c. c. normal horse (No. 15) serum, intraperitoneally. No symptoms.

March 26, 1907, 6 c. c. normal horse (roan) serum, intraperitoneally. No symptoms.

For other instances of this variation of susceptibility see Part IX, pages 59 to 62, Bulletin 29, Hygienic Laboratory, United States Public Health and Marine-Hospital Service.

Part IX.

MATERNAL TRANSMISSION OF HYPERSUSCEPTIBILITY AND IMMUNITY.

In our previous work we showed that hypersusceptibility to the toxic effects of horse serum may be transmitted from the mother guinea pig to her young. Later, one of us (Anderson) showed that the female guinea pig may transmit hypersusceptibility to horse serum and immunity to diphtheria toxine at the same time. On account of certain analogies between the reaction to tuberculin and the toxic action of horse serum, we have made further studies along these lines. In this bulletin we shall refer only to our studies upon the transmission of hypersusceptibility and immunity to the toxic action of horse serum, leaving related studies with tuberculosis and tuberculin for a future publication.

Our present studies corroborate the fact that hypersusceptibility to the toxic action of horse serum is always transmitted from the mother guinea pig to her young. This function is solely maternal; the male takes no part whatever in the transmission of these acquired properties. Whether this maternal transmission is hereditary or congenital can not be definitely stated.

We are able to exclude the milk as a factor in transmitting the hypersusceptibility to the toxic action of horse serum by a series of exchange experiments, which are given in detail below.

"Exchange" experiments consist in at once placing guinea pigs born of a susceptible mother to nurse with an untreated female and, in exchange, the young of the untreated female are at the same time placed to nurse with the susceptible female. From these "exchange" experiments we learn that the hypersusceptibility is not transmitted to the young in the milk.

We also learn from our experiments that hypersusceptibility may be transmitted from mother to young whether the mother is sensitized before or after conception. The fact that this influence may take place after conception might be taken to indicate that the transmission is congenital and not hereditary.

GROUP A.

FAMILY NO. 1.

(Sensitized female; untreated male.)

Female (G. P. No. 610). October 20, 1906. Six c. c. antitoxic horse serum. (Natl. IX, 17) intraperitoneally. Dead, 30 minutes.

[**Previous treatment:** 151 days prior, 0.15 c. c. toxine No. 9+$\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (G. P. No. 102). June 8, 1906. Untreated. Put in cage with above female after female was sensitized.

Offspring. August 24, 1906. Four young born. Two tested as follows:

G. P. No. 610a. October 20. 59 days old. Three c. c. antitoxic horse serum (Natl. IX, 17) intraperitoneally. Dead, 4 minutes.

(G. P. No. 610b.) Ditto. Dead, 60 minutes.

FAMILY NO. 2.

(Sensitized female; untreated male.)

Female (G. P. No. 612). January 25, 1907. Six c. c. normal horse serum (horse No. 15) intraperitoneally. Very severe symptoms.

[Previous treatment: 245 days prior, 0.15 c. c. toxine 9 + $\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (untreated). June 8, 1906. Placed in cage with above female after she was sensitized.

Offspring. One young born January 10, 1907, and tested as follows:

(G. P. No. 612a.) January 25. 15 days old. Two c. c. horse serum (horse No. 15) intraperitoneally. Marked symptoms.

FAMILY NO. 3.

(Sensitized female; untreated male.)

Female (G. P. No. 611). September 7, 1906. Six c. c. normal horse serum (roan) intraperitoneally. Dead, 120 minutes.

[Previous treatment: 106 days prior, received 0.15 c. c. toxine 9+$\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (untreated). Paired 17 days after treatment of female.

Offspring. One young. Tested as follows:

(G. P. No. 611a.) September 7, 1906. 2 days old. One c. c. normal horse serum (roan) intraperitoneally. Dead, 20 minutes.

FAMILY NO. 4.

(Sensitized female; untreated male. Exchange.)

Female (G. P. No. 613). February 27, 1907. Six c. c. normal horse (roan) serum intraperitoneally. Very severe symptoms.

[Previous treatment: 282 days prior 0.15 c. c. toxine 9 + $\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (G. P. No. 10x). June 8, 1906. Untreated. Put into cage 18 days after female was sensitized.

Offspring. January 22, 1907. Two young born and at once put to nurse with untreated female. Tested as follows:

(G. P. No. 613a.) February 27, 1907. 36 days old. Two c. c. normal (roan) horse serum intraperitoneally. Very severe symptoms.

(G. P. No. 613b.) Ditto. Dead, 45 minutes.

Two young, born of untreated female, put to nurse with above sensitized female (No. 613). Tested as follows:

(G. P. No. P-68a.) February 27, 1907. 36 days old. Two c. c. normal horse (roan) serum intraperitoneally. No symptoms.

(G. P. No. P-68b.) Ditto. No symptoms.

FAMILY NO. 5.

(Sensitized female; untreated male. Exchange.)

Female (G. P. No. 614). March 26, 1907. Six c. c. normal horse (roan) serum intraperitoneally. Dead, 38 minutes.

[Previous treatment; 309 days prior, 0.15 c. c. toxine No. 9+$\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (G. P. No. 10). June 8, 1906. Untreated. Put in cage after female was sensitized.

Offspring. February 17, 1907. Two young born, at once put to nurse with untreated female, and tested as follows:

(G. P. No. 614a). March 26, 1907. 38 days old. Two c. c. normal horse (roan) serum intraperitoneally. Dead, 25 minutes.

(G. P. No. 614b). Ditto. Dead, 20 minutes.

Two young, born of untreated female and nursed with above sensitized female (614), tested as follows:

(G. P. No. P-20). March 26, 1907. 38 days old. Two c. c. normal horse (roan) serum intraperitoneally. No symptoms.

(G. P. No. P-20a). Ditto. No symptoms.

GROUP B.

FAMILY NO. 6.

(Sensitized female; sensitized male. Exchange.)

Female (G. P. No. 601). October 23, 1906. Six c. c. antitoxic horse serum (Natl. IX, 18) intraperitoneally. Dead, 15 minutes.

[Previous treatment: 153 days prior, 0.15 c. c. toxine No. 9 + $\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (G. P. No. 606x). Paired after both were sensitized. September 7, 1906. Six c. c. normal horse (roan) serum intraperitoneally. Dead, 17 minutes.

[Previous treatment: 106 days prior, 0.15 c. c. toxine No. 9 + $\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Offspring. Two young, born August 28, 1906. Immediately nursed with an untreated female.

(G. P. No. 601a.) October 23, 1906. 56 days old. Three c. c. antitoxic horse serum (Natl. IX, 18) intraperitoneally. Severe symptoms.

(G. P. No. 601b.) Ditto. Severe symptoms.

Three untreated young pigs placed to nurse with the above mother (No. 601).

(G. P. No. X.) October 23. 56 days old. Three c. c. antitoxic horse serum intraperitoneally. No symptoms.

(G. P. No. Y.) Ditto. No symptoms.

(G. P. No. Z.) Ditto. No symptoms.

(G. P. mother of X, Y, and Z.) October 23. Six c. c. same serum intraperitoneally. No symptoms.

FAMILY NO. 7.

(Sensitized female; sensitized male. Exchange.)

Female (G. P. No. 603). February 27, 1907. Six c. c. normal horse (roan) serum intraperitoneally. Dead, 45 minutes.

[Previous treatment: 282 days prior, 0.15 c. c. toxine No. 9+$\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Male (G. P. No. 606y). June 8, 1906. Placed in cage with above female after both were sensitized.

Offspring. January 17, 1907. Two young born, nursed with untreated female, and tested as follows:

(G. P. No. 603a.) February 27, 1907. 41 days old. Two c. c. normal horse (roan) serum intraperitoneally. Marked symptoms.

(G. P. No. 603b.) Ditto. Very severe symptoms.

Three young, born of untreated female and nursed with above sensitized female (603), tested as follows:

(G. P. No. 66a.) February 27, 1907. 41 days old. Two c. c. normal horse (roan) serum intraperitoneally. No symptoms.

(G. P. No. 66b.) Ditto. No symptoms.

(G. P. No. 66c.) Ditto. No symptoms.

GROUP C.

FAMILY NO. 8.

(Immune female; immune male.)

Female (G. P. No. 428). January 25, 1907. Six c. c. normal horse serum (horse No. 15) intraperitoneally. Slight symptoms.

[Previous treatment: May 18 to June 27, 1906, 1 c. c. normal horse (roan) serum daily (except Sunday), subcutaneously, 22 injections.]

Male (G. P. No. 4530). June 8, 1906. Immune. Placed in cage with above female. For history of this male see Family No. 14.

Offsping. December 28, 1906. Two young born and nursed with own mother. Tested as follows:

(G. P. No. 428a.) January 25, 1907. 28 days old. Two c. c. normal horse serum (horse No. 15) intraperitoneally. Marked symptoms.

(G. P. No. 428b.) Ditto. Marked symptoms.

FAMILY NO. 9.

(Immune female; immune male. Exchange.)

Female (G. P. No. 4426). January 10, 1906. 0.002 c. c. toxine 7. Severe reaction, slough.

January 18, 1906. Six c. c. normal horse serum (horse No. 15) intraperitoneally. No symptoms.

February 14, 1906. Six c. c. antitoxic horse serum (Natl. VIII, 17) intraperitoneally. Symptoms.

February 23, 1906. Ditto. No symptoms.

March 29, 1906. Ditto. Mild symptoms.

April 18, 1906. Ditto (Natl. VIII, 18). No symptoms.

[illegible] Six c. c. normal (roan) horse serum intraperitoneally. Severe

One c. c. normal horse (roan) serum subcutaneously
[illegible] injections. No symptoms.
[illegible] c. c. normal (No. 15). No symptoms.
[illegible] c. normal (roan). No symptoms.

Male (G. P. No. 4530). June 8, 1906. Immune. Placed in cage with above female.
Previous treatment:
January 12, 1906. 0.19 c. c. toxine 7 + 1 unit antitoxic horse serum (B27).
January 22, 1906. Six c. c. antitoxic horse serum (Natl. VIII, 17) intraperitoneally. Definite symptoms.
February 6, 1906. Ditto. Symptoms.
February 8, 1906. Ditto. No symptoms.
February 14, 1906. Ditto. No symptoms.
February 23, 1906. Ditto. No symptoms.
March 25, 1906. Ditto (Natl. VIII, 18). No symptoms.
April 18, 1906. Ditto. Ditto. No symptoms.
May 16, 1906. Six c. c. normal horse (roan) serum intraperitoneally. No symptoms.
May 18 to June 27, 1906. One c. c. same serum subcutaneously daily (except Sunday), 22 injections. No symptoms.
January 25, 1907. Six c. c. normal horse serum (horse No. 15). Very slight symptoms.

Offspring, first litter. One young born December 26, 1906. As soon as born, placed to nurse with untreated female (pen 120), whose young were placed to nurse with G. P. No. 4426.
(G. P. No. 4426a.) January 25, 1907. Two c. c. normal horse (No. 15) serum intraperitoneally, when 30 days old. No symptoms.
Young of untreated female P. 120.
(G. P. No. P. 120a.) January 25, 1907. 35 days old. Two c. c. normal horse (No. 15) serum intraperitoneally. No symptoms.
February 18, 1907. 24 days later. Six c. c. same serum. Very severe symptoms.
(G. P. No. P. 120b.) January 25, 1907. Same as G. P. No .P. 120a. No. symptoms.
February 18, 1907. Ditto. Dead, 70 minutes.
Second litter. Three young born March 1, 1907, and not exchanged.
(G. P. No. 4426b.) March 26, 1907. 25 days old. Two c. c. normal horse (roan) serum intraperitoneally. No symptoms.
(G. P. No. 4426c.) Same treatment. No symptoms.
(G. P. No. 4426d.) Same treatment. No symptoms.

These three pigs were again tested April 18 with 4 c. c. of normal horse (roan) serum into the peritoneal cavity. All three showed slight symptoms, thus proving that immunity, or "antianaphylaxis," was not transmitted from the mother.

FAMILY NO. 10.

(Immune female; immune male. Exchange.)

Female (G. P. No. 429). January 25, 1907. Six c. c. normal horse (No. 15) serum intraperitoneally. Slight symptoms.
[Previous treatment: May 18 to June 27, 1906, 1 c. c. normal horse (roan) serum daily except Sunday, 22 injections.]

Male (G. P. No. 4530). June 8, 1906. Placed in cage with female.
For history of this male, see Family No. 14.

Offspring. Three young, born December 29, 1906, and nursed with untreated G. P. No. P. 50. Tested as follows:

(G. P. No. 429a.) January 25, 1907. 27 days old. Two c. c. normal horse serum (horse No. 15) intraperitoneally. Marked symptoms.

(G. P. No. 429b.) Ditto. Marked symptoms.

(G. P. No. 429c.) Ditto. Marked symptoms.

Two young of untreated G. P. No. P. 50 nursed with immune female No. 429, and tested as follows:

(G. P. No. P. 50a.) January 25, 1907. 27 days old. Two c. c. normal horse serum (horse No. 15) intraperitoneally. No symptoms.

(G. P. No. P. 50b.) Ditto. No symptoms.

GROUP D.

FAMILY NO. 11.

(Immune female; untreated male.)

Female (G. P. No. 410). January 15, 1906. One c. c. antitoxic horse serum (Natl. VIII, 17). No symptoms.

January 23, 1906. Ditto. No symptoms.

February 8, 1906. Six c. c. same serum. No symptoms.

February 14, 1906. Ditto. No symptoms.

February 23, 1906. Ditto. No symptoms.

March 29, 1906. Six c. c. antitoxic horse serum (Natl. VIII, 18). No symptoms.

April 18, 1906. Ditto. No symptoms.

May 16, 1906. Six c. c. normal horse (roan) serum. No symptoms.

May 18 to June 27, 1906, daily. One c. c. same serum. No symptoms.

September 7, 1906. Six c. c. normal horse (roan) serum intraperitoneally. No symptoms.

All injections subcutaneously.

Male (G. P. No. 410m). June 8, 1906. Untreated. Put in cage after female was immunized.

Offspring. July 20, 1906. Three young born, and tested as follows:

(G. P. No. 410a.) September 7, 1906. 18 days old. Two c. c. normal horse (roan) serum intraperitoneally. No symptoms.

(G. P. No. 410b.) Ditto. No symptoms.

(G. P. No. 410c.) Ditto. No symptoms.

FAMILY NO. 12.

(Immune female; untreated male.)

Female (G. P. No. 430). February 27, 1907. Six c. c. normal horse (roan) serum intraperitoneally. Severe symptoms.

[Previous treatment: 245 days prior (May 18 to June 27). One c. c. normal horse (roan) serum subcutaneously daily.]

Male (G. P. No. —). June 8, 1906. Untreated. Put in cage during period of immunization.

Offspring. January 22, 1907. Two young born and nursed with mother. Tested as follows:

(G. P. No. 430a). February 27, 1907. 36 days old. Two c. c. normal horse (roan) serum intraperitoneally. Marked symptoms.

(G. P. No. 430b.) Ditto. Marked symptoms.

(G. P. No. 430c.) Ditto. Mild symptoms.

FAMILY NO. 13.

(Immune female; untreated male.)

Female (G. P. No. 110). February 8 to 20, 1906. One c. c. Daily subcutaneous injections 1 c. c. antitoxic horse serum (Natl. IX, 19). No symptoms.

March 29, 1906. Six c. c. antitoxic horse serum (Natl. VIII, 18). Mild symptoms.

April 4 to 17, 1906. One c. c. daily injections antitoxic horse serum (Natl. IX, 17). No symptoms.

April 23, 1906. Six c. c. normal horse (roan) serum. Very slight symptoms.

May 15, 1906. Ditto. Very slight symptoms.

May 18 to June 27, 1906. One c. c. daily, same serum. No symptoms.

September 7, 1906. Six c. c. normal horse (roan) serum, intraperitoneally. Very slight symptoms.

Male (G. P. No. —). June 8, 1906. Untreated. Put in cage after immunization of female was well advanced.

Offspring. August 10, 1906. One young born, and tested as follows:

(G. P. No. 110a.) September 7, 1906. 27 days old. Two c. c. normal horse (roan) serum intraperitoneally. Very slight symptoms.

FAMILY NO. 14.

(Immune female; untreated male.)

Female (G. P. No. 426). September 7, 1906. Six c. c. normal horse (roan) serum, intraperitoneally. Slight symptoms.

[Previous treatment: May 19 to June 27, 1906, 1 c. c. daily subcutaneous injections of normal horse (roan) serum.]

Male (G. P. No. 426m). June 8, 1906. Untreated. Put in cage during period of immunization of female.

Offspring. July 24, 1906. Two young born, and tested as follows:

(G. P. No. 426a.) September 7, 1906. 41 days old. Two c. c. normal horse (roan) serum, intraperitoneally. Slight symptoms.

(G. P. No. 426b.) Ditto. Slight symptoms.

FAMILY NO. 15.

(Immune female; untreated male. Exchange.)

Female (G. P. No. 427). February 27, 1907. Six c. c. normal horse (roan) serum intraperitoneally. Severe symptoms.

[Previous treatment: 245 days prior (May 18 to June 26) 1 c. c. normal horse (roan) serum subcutaneously daily.] No symptoms.

Male (G. P. No. 42601). June 8, 1906. Normal. Put into cage during period of immunization of female.

Offspring. January 22, 1907. Two young born. At once placed to nurse with untreated female. Tested as follows:

(G. P. No. 427a.) February 27, 1907. 36 days old. Three c. c. normal horse (roan) serum intraperitoneally. Severe symptoms.

(G. P. No. 427b.) Ditto. Dead, 62 minutes.

Two young born of untreated female, but nursed with above female No. 427, tested as follows:

(G. P. No. P. 108a.) February 27, 1907. 36 days old. Three c. c. normal horse (roan) serum intraperitoneally. No symptoms.

(G. P. No. P. 108b.) Ditto. No symptoms.

GROUP E.

FAMILY NO. 16.

(Untreated female; sensitized male.)

Female (G. P. No. 606). September 7, 1906. Six c. c. horse serum intraperitoneally. No prior treatment. No symptoms.

Male (G. P. No. 606x). September 9, 1906. Six c. c. horse serum (roan) intraperitoneally. Dead, 17 minutes.

[Previous treatment: 106 days prior received 0.15 c. c. tox. $9+\frac{1}{250}$ c. c. antitoxic horse serum (Natl. VIII, 18).]

Offspring. Two young born August 4, 1906, and tested as follows:

(G. P. No. 606a.) September 9, 1906. 1 month old. Two c. c. normal horse serum into peritoneum. No symptoms.

(G. P. No. 606b.) September 9, 1906. 1 month old. Two c. c. normal horse serum (roan) into peritoneum. No symptoms.

FAMILY NO. 17.

(Untreated female; sensitized male.)

Females (G. P. No. 609). January 25, 1907. Six c. c. normal horse serum (horse No. 15), intraperitoneally. No prior treatment. No symptoms.

(G. P. No. 607). Ditto. No prior treatment. No symptoms.

Male (G. P. No. 4527). January 25, 1907. Six c. c. normal horse serum (horse No. 15), intraperitoneally. Dead, 37 minutes.

[Previous treatment: 1 year 13 days prior, 0.19 c. c. toxine No. 7+1 unit B27.]

June 8, 1906. Placed with untreated females Nos. 609 and 607.

Offspring. December 26, 1906. Three young born to G. P. No. 609. September 6, 1906. One young born to G. P. No. 607.

Young tested as follows:

(G. P. No. 609a). January 25, 1907. 30 days old. Two c. c. normal horse serum (horse No. 15) intraperitoneally. No symptoms.

(G. P. No. 609b). Ditto. No symptoms.

(G. P. No. 609c). Ditto. No symptoms.

(G. P. No. 607a). Ditto (141 days old). No symptoms.

We conclude from these experiments that—

1. Hypersusceptibility to the toxic action of horse serum is transmitted through the female guinea pig; the male has no influence.

2. The susceptibility is not transmitted through the milk.

3. Maternal transmission of hypersusceptibility succeeds, whether the female guinea pig is sensitized before or after conception.

Part X.

THE RELATION OF HYPERSUSCEPTIBILITY TO VARIOUS INFLUENCES.

We have already shown that hypersusceptibility to the action of horse serum in the guinea pig has no evident relation to hemolysis or precipitins. We offer the following experiments, planned with the object of correlating hypersusceptibility with other phenomena:

RELATION TO AGGRESSINES.

The work of Bail upon aggressine induced us to try whether a similar action may explain hypersusceptibility. The following experiments indicate that no relation exists between the two phenomena.

PERITONEAL FLUID FROM NORMAL GUINEA PIG INTO SENSITIZED GUINEA PIG.

Eight c. c. of normal horse (No. 15) serum was injected into the peritoneal cavity of a normal guinea pig. This produced no symptom. Two hours later the animal was chloroformed and about 6 c. c. of fluid was taken from the peritoneal cavity and injected into the following sensitized guinea pig:

G. P. No. 7050. Six c. c. of above fluid into peritoneal cavity. Dead, 20 minutes.
[Previous treatment: 57 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{200}$ c. c. antitoxic horse serum (S. 063H), subcutaneously.]

PERITONEAL FLUID FROM SENSITIZED GUINEA PIG INTO NORMAL GUINEA PIG.

Six c. c. of normal horse (No. 15) serum was injected into the peritoneal cavity of G. P. No. 7051, which had been sensitized fifty-seven days previously with 0.142 c. c. toxine No. 5+$\frac{1}{200}$ c. c. axtitoxic horse serum (S. 063H). The guinea pig developed typical symptoms and died in fifteen minutes as a result of the second injection. Fifteen minutes after the death of this guinea pig about 4 c. c. of the peritoneal contents were withdrawn and injected into the peritoneal cavity of a normal guinea pig. This caused no symptoms.

PERITONEAL FLUID FROM SENSITIZED GUINEA PIG INTO SENSITIZED GUINEA PIG.

Six c. c. normal horse (No. 15) serum was injected into the peritoneal cavity of a sensitized guinea pig (No. 7068) which had received fifty-five days previously a subcutaneous injection of 0.142 c. c. toxine No. 5+$\frac{1}{100}$ c. c. antitoxic horse serum (Natl. V, 7). As a result of the second injection of horse serum the guinea pig had characteristic symptoms and died in thirty minutes. Fifteen minutes after the

death of this guinea pig about 3 c. c. of the peritoneal contents were collected and injected into the following sensitized guinea pig:

G. P. No. 7026. Three c. c. of above fluid into peritoneal cavity. Very severe symptoms.

[Previous treatment: 57 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{100}$ c. c. antitoxic horse serum (Ld. 8), subcutaneously.]

PERITONEAL FLUID FROM SENSITIZED GUINEA PIGS INTO NORMAL GUINEA PIGS.

The peritoneal contents were collected immediately after the death from 9 sensitized guinea pigs that had received 6 c. c. normal horse serum (No. 15) each; 3.5 c. c. of this fluid was injected into the peritoneal cavity of a normal guinea pig, but produced no symptoms.

After withdrawing the fluid of the peritoneal cavities of the above 9 guinea pigs the peritoneal cavities were washed with sterile salt solution and this fluid injected into the following normal guinea pigs:

G. P. No. A.—6 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

B.—5 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

C.—7.5 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

D.—10 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

E.—20 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

F.—6 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

G.—6 c. c. saline washings from above 9 guinea pigs, intraperitoneally. No symptoms.

RELATION TO METHEMAGLOBIN POISONING.

The symptoms in the guinea pig somewhat resemble methemaglobin poisoning. We are indebted to Assistant Surgeon A. M. Stimson for comparative spectroscopic studies of the blood of normal guinea pigs and of the blood of susceptible guinea pigs immediately after death caused by a second injection of horse serum. No methemaglobin was found. Only the bands corresponding to oxyhemaglobin were seen in the blood of the guinea pigs examined immediately after death.

OXYGEN HAS NO INFLUENCE UPON THE SYMPTOMS.

A sensitized guinea pig was inoculated with horse serum and at once placed in an almost pure atmosphere of oxygen. Another sensitized guinea pig (not reinoculated) was placed under the same bell jar as a control. The inoculated pig developed symptoms and was dead in thirty-five minutes. The control animal showed no unusual manifestations after thirty minutes in the atmosphere of oxygen. It was then given an injection of horse serum and immediately replaced under the

bell jar. It developed characteristic symptoms and died in fifteen minutes.

G. P. No. 7028. Six c. c. antitoxic horse serum (Natl. IX, 17), intraperitoneally; immediately placed in an atmosphere of almost pure oxygen. Dead, 35 minntes.

[Previous treatment: 54 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{\frac{1}{10}}$ c. c. antitoxic horse serum (Led. 8).]

Control G. P. Kept 30 minutes in same atmosphere. No symptoms.

[Previous treatment: 52 days prior, 0.142 c. c. toxine No. 5+$\frac{1}{\frac{1}{10}}$ c. c. antitoxic horse serum (PDCo. 07555A).]

At the end of 30 minutes in oxygen atmosphere, given 6 c. c. antitoxic horse serum (Natl. IX, 17), intraperitoneally. Dead, 15 minutes.

THE INFLUENCE OF DIPHTHERIA TOXINE UPON HYPERSUSCEPTIBILITY.

The question was raised by both Otto and us as to the influence of the diphtheria toxine in accentuating the phenomenon of hypersusceptibility.

While guinea pigs may be sensitized with fresh normal horse serum alone, it seemed to us and also to Otto that a greater degree of hypersusceptibility is produced when sensitized with a mixture of diphtheria toxine and antitoxic horse serum than when the horse serum alone is given at the first injection. It seems, however, that this is by no means always the case.

All the guinea pigs in the following series were sensitized with $\frac{1}{\frac{1}{10}}$ c. c. of antitoxic horse serum (Alex. A., 228) precipitated and dialyzed according to Gibson's method. One-half the animals received, in addition, 0.2 c. c. toxine No. 7 (MLD = 0.006). After thirty-one days interval all the guinea pigs were tested with 3 c. c. normal horse serum (roan) into the peritoneal cavity.

[All tested by injecting 3 c. c. normal horse (No. 15) serum intraperitoneally.]

No. G. P.	Previous treatment, 31 days prior.	Result.
720	$\frac{1}{\frac{1}{10}}$ c. c. precipitated antitoxic horse serum (Alex. A., 228), subcutaneously.	Dead, 28 minutes.
721	.....do.....	Dead, 12 minutes.
722	.....do.....	Very severe symptoms.
723	.....do.....	Dead, 44 minutes.
724	.....do.....	Dead, 10 minutes.
725	.....do.....	Very severe symptoms.
726	.....do.....	Very severe symptoms.
727	.....do.....	Very severe symptoms.
728	.....do.....	Very severe symptoms.
729	.....do.....	Very severe symptoms.
710	Ditto + 0.2 c. c. toxine No. 7.....	Dead, 10 minutes.
711	.....do.....	Very severe symptoms.
712	.....do.....	Dead, 10 minutes.
713	.....do.....	Dead, 43 minutes.
714	.....do.....	Dead, 31 minutes.
715	.....do.....	Very severe symptoms.
716	.....do.....	Dead, 27 minutes.
717	.....do.....	Severe symptoms.
718	.....do.....	Very severe symptoms.
719	.....do.....	Dead, 92 minutes.

THE INFLUENCE OF TETANUS TOXINE UPON HYPERSUSCEPTIBILITY.

Besredka and Steinhart[a] intimate that guinea pigs sensitized with a mixture of tetanus toxine and antitetanic serum are not sensitive to subsequent injections of horse serum. These scientists, however, suggest that their failures on this point may have been due to the small amount of horse serum used at the first injection, viz, $\frac{1}{10000}$ and $\frac{1}{100000}$ c. c.

We tested some of our used tetanus guinea pigs to determine this point and found that tetanus toxine does not apparently influence the phenomenon of hypersusceptibility to horse serum. The guinea pigs were sensitized with 0.0006 gm. of a dried tetanus toxine, which represents 100 minimal lethal doses, plus various amounts of antitetanic serum. All those tested reacted to a second injection of horse serum.

Tetanus toxine.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
438	0.0006 gm. tetanus toxine A + $\frac{1}{500}$ c. c. antitoxic horse serum (Hoechst) subcutaneously.	17	6 c. c. normal horse (roan) serum, intraperitoneally.	Dead, 30 minutes.
439	0.0006 gm. tetanus toxine A + $\frac{1}{700}$ c. c. antitoxic horse serum (Hoechst) subcutaneously.	17	.....do	Dead, 30 minutes.
444	0.0006 gm. tetanus toxine A + $\frac{1}{1200}$ c. c. antitoxic horse serum (Hoechst) subcutaneously.	28	.....do	Very severe symptoms.
447	0.0006 gm. tetanus toxine A + $\frac{1}{500}$ (M 2122) c. c. antitoxic horse serum subcutaneously.	28	.....do	Very severe symptoms.
451	0.0006 gm. tetanus toxine A + $\frac{1}{500}$ (Pk) c. c. antitoxic horse serum subcutaneously.	28	6 c. c. normal horse (roan) serum, intraperitoneally (Pasteur Institute).	Dead, 10 minutes.
440	0.0006 gm. tetanus toxine A + $\frac{1}{800}$ (Hoechst) c. c. antitoxic horse serum subcutaneously.	28	.....do	Dead, 10 minutes.

THE RELATION OF THE SPLEEN AND THYROID TO HYPERSUSCEPTIBILITY.

While we believe that this reaction is probably localized in the central nervous system, several experiments were undertaken to determine what influence the spleen or the thyroid gland may have upon the hypersusceptibility produced by the injection of horse serum.

[a] Ann. Pasteur Inst., Vol. 21, No. 2, 1907, pp. 117–127.

The removal of the thyroid gland or the spleen either before or after an injection of horse serum does not prevent the phenomenon of hypersusceptibility.

It is of interest to note that the guinea pigs upon which splenectomy was performed lost much hair and became reduced in weight, although the appetite seemed to remain good.

THYROIDECTOMY.

G. P. No. 7017. 0.142 c. c. toxine No. 5+$\frac{1}{100}$ c. c. antitoxic horse serum (Mem. A1103), subcutaneously.

55 days later, thyroid removed.

80 days from sensitizing inoculation and 25 days after thyroidectomy, given 6 c. c. normal horse (No. 15) serum, subcutaneously. Dead, 10 minutes.

G. P. No. 7018. O. 142 c. c. toxine No. 5+$\frac{1}{100}$ c. c. antitoxic horse serum (Mem. 1103).

55 days later, thyroid removed.

125 days from sensitizing inoculation and 70 days after thyroidectomy, given 6 c. c. normal horse (No. 15) serum, intraperitoneally. Dead, 30 minutes.

G. P. No. X. Untreated. Thyroid removed.

11 days after thyroidectomy, given 0.15 c. c. toxine No. 9 + $\frac{1}{100}$ c. c. antitoxic horse serum (PD., 08516), subcutaneously.

17 days after sensitizing inoculation and 28 days after thyroidectomy, given 6 c. c. normal horse (No. 15) serum, intraperitoneally. Dead, 28 minutes.

G. P. No. 425W. Untreated. Thyroid removed.

11 days later, 0.15 c. c. toxine No. 9+$\frac{1}{100}$ c. c. antitoxic horse serum (PD .08516).

69 days after sensitizing inoculation and 58 days after thyroidectomy, 6 c. c. normal horse (No. 15) serum, intraperitoneally. Dead, 5 minutes.

SPLENECTOMY.

G. P. No. 7044. 0.142 c. c. toxine No. 5+$\frac{1}{100}$ c. c. antitoxic horse serum (Hb. 21A), subcutaneously.

55 days later, spleen removed.

80 days from sensitizing inoculation and 25 days after splenectomy, 6 c. c. normal horse (No. 15) serum, intraperitoneally. Very severe symptoms.

G. P. No. 7024. 0.142 c. c. toxine No. 5+$\frac{1}{100}$ c. c. antitoxic horse serum (Mem 1103), subcutaneously.

55 days later, spleen removed.

80 days from sensitizing inoculation and 25 days after splenectomy, 6 c. c. normal horse (No. 15) serum, intraperitoneally. Very severe symptoms.

G. P. No. 380W. Spleen removed.

69 days later, 6 c. c. normal horse (No. 15) serum, intraperitoneally. No symptoms.

G. P. No. XY. Spleen removed.

11 days later, 0.15 c. c. toxine No. 9+$\frac{1}{100}$ c. c. antitoxic horse serum (PD. 08516), subcutaneously.

28 days after splenectomy and 17 days after sensitizing, 6 c. c. normal horse (No. 15) serum, intraperitoneally. Severe symptoms.

G. P. No. 410W. Spleen removed.

11 days later, 0.15 c. c. toxine No. 9+$\frac{1}{100}$ c. c. antitoxic horse serum (PD. 08516), subcutaneously.

58 days after sensitizing and 69 days after splenectomy, 6 c. c. normal horse (No. 15) serum, intraperitoneally. Marked symptoms.

Part XI.

MISCELLANEOUS.

FEEDING EXPERIMENTS WITH COOKED MEAT.

In our former work we showed that guinea pigs may be sensitized by feeding them blood serum or meat. We know that heating blood serum to 100° C. for fifteen minutes is sufficient to destroy its toxic action. We then asked ourselves the question, Would the heating of meat prevent the sensitizing action? The following experiments indicate that heat does destroy this property of meat, as far as the guinea pig is concerned.

In these experiments well-cooked horse meat was used. It was heated in the hot air sterilizer at 110° C. for thirty minutes. Two grams of it was fed to the animals daily from June 15 to June 30. Each guinea pig, therefore, received 32 gm. of the cooked meat. None of them showed symptoms when injected eighteen days later with 6 c. c. of normal horse serum.

No. G. P.	First treatment.	Interval.	Second treatment.	Result.
		Days.		
496	Fed 2 gm. horse meat, heated to 110° C. (hot air) 30 minutes, daily for 16 days.	18	6 c. c. normal horse (roan) serum, intraperitoneally.	No symptoms.
497	.....do.....	18	.....do	No symptoms.
498	.....do.....	18	.....do	No symptoms.
499	.....do.....	18	.....do	No symptoms.
500	.....do.....	18	.....do	No symptoms.

FEEDING EXPERIMENTS WITH RAW BEEF.

We know that guinea pigs fed with horse serum or horse meat are susceptible to subsequent injections of horse serum, and we are now able to show, by the following series of experiments, that guinea pigs fed with beef are susceptible to subsequent injections of cattle serum:

No. G. P.	First treatment.	Interval.	Second treatment.	Result.
		Days.		
501	Fed 2 gm. dried beef daily for 23 days.	19	6 c. c. cattle serum, intraperitoneally.	Mild symptoms.
502	.....do.....	19	.....do	Mild symptoms.
503	.....do.....	19	.....do	Severe symptons.

RESULT OF CARDIAC INJECTIONS.

We have shown that guinea pigs may be readily sensitized by subcutaneous or intraperitoneal inoculations, and that the second injection produces symptoms when the serum is injected either under the skin or into the peritoneal cavity.

Besredka and Steinhardt have shown that the injection of serum into the brain of a sensitized guinea pig is very poisonous. We are able to confirm this observation. We then asked ourselves the question, Can guinea pigs be sensitized by injecting the horse serum directly into the heart? And can sensitized guinea pigs be poisoned by such injections directly into the circulation? We are now enabled to answer these questions affirmatively, in view of the following experiments:

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
7077	0.142 c. c. toxine 5+$\frac{1}{2}\frac{1}{5}$ c. c. antitoxic horse serum (NYBH. 17), subcutaneously.	131	1.5 c. c. normal horse (roan) serum, into heart.	Dead, 3 minutes.
7692	0.142 c. c. toxine 5+$\frac{1}{4}\frac{1}{5}$ c. c. antitoxic horse serum (A. 247), subcutaneously.	35	0.01 c. c. normal horse (roan) serum, into heart.	Dead, 55 minutes.
7630	0.142 c. c. toxine 5+$\frac{1}{3}\frac{1}{5}$ c. c. antitoxic horse serum (A. ppt. 31), subcutaneously.	44	1 c. c. normal horse (roan) serum, into heart.	Dead, 3½ minutes.
7632	0.142 c. c. toxine 5+$\frac{1}{2}\frac{1}{5}$ c. c. antitoxic horse serum (A. ppt. 31), subcutaneously.	44	.....do	Dead, 3 minutes.
7691	0.142 c. c. toxine 5+$\frac{1}{4}\frac{1}{5}$ c. c. antitoxic horse serum (A. 247), subcutaneously.	35	.....do	Dead, 3 minutes.
Control.	2 c. c. normal horse (roan) serum, into heart.	.....	.....	No symptoms.
	Same guinea pig	20 days later.	6 c. c. normal horse (roan) serum, intraperitoneally.	Marked symptoms.

These experiments indicate that the endothelial cells lining the peritoneal cavity or the connective cells of the subcutaneous tissue do not necessarily play a rôle in the phenomenon we are studying.

THE GUINEA PIG REMAINS SUSCEPTIBLE A VERY LONG TIME.

That the guinea pig remains susceptible to the toxic action of horse serum a very long time is indicated in the following experiments, in

which 378 days elapsed between the first treatment and the second injection.

No. G. P.	First injection.	Interval.	Second injection.	Result.
		Days.		
4515	0.19 c. c. toxine 7+1 unit antitoxic horse serum (B. 27), subcutaneously.	238	6 c. c. normal horse (roan) serum, intraperitoneally.	Dead, 30 minutes.
4527	.....do.....	378	6 c. c. normal horse (No. 15) serum intraperitoneally.	Dead, 37 minutes.
4495	.....do.....	365	.....do.....	No symptoms.
			Ditto, 2 days later..	Severe symptoms.
	Two young, born of above female (4495), tested as follows:			
4495a	When 7 days old, 1 c. c. normal horse (No. 15) serum, intraperitoneally.			Dead, 13 minutes.
4495b	When 9 days old, 1 c. c. normal horse (No. 15) serum, intraperitoneally.			Dead, 12 minutes.

The above guinea pig (No. 4495) showed no symptoms at all after receiving 6 c. c. of horse serum into the peritoneal cavity 365 days after the first injection. It was then given the same quantity of serum two days following and showed severe symptoms. We have had several such instances following intraperitoneal injections, and can only explain it by the fact that sometimes the serum enters the lumen of the intestine instead of the peritoneal cavity. We called attention to this probability in Hygienic Laboratory Bulletin No. 29, page 63.

THE EFFECT OF FIRST INJECTIONS OF HORSE SERUM INTO GUINEA PIGS.

Theobald Smith[a] stated that guinea pigs which have received no preliminary doses of serum may die of a first injection; of 58 guinea pigs receiving 3 to 5 c. c. of diphtheria antitoxin with no preliminary treatment, 9 died and 49 showed no effect, making 15.5 per cent of the guinea pigs reacting to the first injection of horse serum. In reply to a question, Smith stated that he did not know whether or not the animals were the young of guinea pigs that had been treated.

We have injected many guinea pigs with horse serum and have never noted symptoms of death to follow the first injection, and can not help but believe that the results obtained by Smith are explained by our studies upon the maternal transmission of hypersusceptibility.

[a] Smith, Theobald: Discussion of Rosenau and Anderson's paper on "Hypersusceptibility." Journ. Am. Med. Assn., Vol. 27, No. 13, Sept. 29, 1906, p. 1010.

Part XII.

SUMMARY AND CONCLUSIONS.

Profound chemical changes, perhaps in the central nervous system, are probably produced by the first injection of a strange proteid.

Guinea pigs may be sensitized with horse serum by injections directly into the heart. From this it appears that the cells lining the peritoneal cavity or the connective tissue cells of the subcutaneous tissue do not necessarily play a part in the phenomenon of hypersusceptibility.

Guinea pigs may be sensitized with the filtrate obtained from horse serum after precipitation with ammonium sulphate.

Formaldehyd does not appreciably influence the toxicity of horse serum and has no effect upon the sensitizing action.

The sensitizing substance is not dialyzable through a collodion sac.

The toxic principle is not altered by various ferments, such as taka-diastase, pancreatin, rennin, myrosin, invertin, emulsin, pepsin, ingluvin, malt, or papain, nor by certain alkaloids, such as atropin, strychnin, morphin, or caffein; it is also not altered by calcium chlorid, sodium nitrate, sodium chlorid, magnesium sulphate, or ammonium sulphate.

Guinea pigs sensitized with horse serum do not react to the second injection of other proteid substances such as peptone, extract of peas, egg albumen, and milk. Conversely, guinea pigs sensitized with subcutaneous injections of these substances do not react to a subsequent injection of horse serum.

Guinea pigs show quite as high a degree to susceptibility to cattle, sheep, hog, dog, and cat serum as they do to horse serum.

Guinea pigs are quite susceptible to injections of hemoglobin, egg albumen, milk, or the extract of peas when given two injections with an interval of at least ten days. Simpler albuminous substances, such as peptone, seem to have slight sensitizing and poisonous properties, while lower nitrogenous compounds such as leucin and tyrosin possess none at all.

The reaction following a second injection of proteid matter in the guinea pig appears to be common to all the higher forms of albuminous substances, no matter from what source.

This phenomenon of hypersusceptibility in the guinea pig may be useful as a physiological test to distinguish true proteid substances from the lower forms of nitrogenous compounds.

The refined antitoxic serum, bulk for bulk, is quite as toxic to sensitized guinea pigs as the untreated serum from which it was precipitated and dialyzed. There is, however, a distinct advantage gained in using the concentrated serum, as the same number of units may be given in half the bulk, and it is well known that the serum reaction in man depends partly upon the quantity of serum given.

Serum from one horse appears quite as toxic as serum from other horses. The apparent differences seem to depend upon something connected with the sensitizing action.

The immunity produced by repeated injections, termed "anti-anaphylaxis" by Besredka and Steinhardt, appears to be relatively not quite as lasting and definite as many instances of active immunity against bacterial infections.

Hypersusceptibility to the toxic action of horse serum is transmitted through the female guinea pig. The male has no influence.

The susceptibility is not transmitted through the milk.

Maternal transmission of hypersusceptibility succeeds whether the female guinea pig is sensitized before or after conception.

The phenomenon of hypersusceptibility appears to have no relation to aggressins.

Methemaglobin is not present in the blood of guinea pigs dead of a second injection of horse serum.

Oxygen has no influence upon the symptoms.

Neither diphtheria toxine nor tetanus toxine appreciably influence the phenomenon of hypersusceptibility produced by horse serum.

The removal of the spleen or thyroid gland does not influence hypersusceptibility in the guinea pig.

Guinea pigs fed upon beef are susceptible to a subsequent injection of cattle serum.

Guinea pigs fed with cooked meat are not susceptible to subsequent injections of serum.

When a second injection of horse serum is given directly into the heart of a susceptible guinea pig the symptoms are manifested with promptness and virulence. Under these circumstances, 0.01 c. c. (injected directly into the heart) in one instance was sufficient to cause the death of a sensitized guinea pig.

Guinea pigs remain susceptible a very long time. There is no diminution in the susceptibility of a guinea pig to subsequeut injections of horse serum for at least one year. The longest period we have observed is 480 days.

We have never seen symptoms resulting from the first injection of horse serum in a guinea pig born of an untreated mother.

The problem of hypersusceptibility has an important bearing upon the question of immunity. Our work indicates that hypersusceptibility is either an essential element or one stage in the process of

resistance to a certain class of diseases. We can not escape the conviction that further studies upon the phenomenon of hypersusceptibility will have an important bearing upon the prevention and cure of certain infectious processes. The hypersusceptibility obtained by bacterial proteids and the subsequent immunity furnishes data for this belief.

From our work upon the proteid substances of animal and vegetable origin, it was but a step to the albuminous content of the bacterial cell. Experimental studies upon the bacterial proteids are of the greatest importance on account of the practical uses to which results along this line may lead.

Hypersusceptibility may easily be induced in guinea pigs with proteid extracts obtained from the bacterial cell. The first injection of the extracts used by us seems comparatively harmless to the animal. A second injection of the same extract shows, however, that profound physiological changes have taken place. A definite period must elapse between the first and the second injection. The symptoms presented by the guinea pig as a result of the second injection resemble those caused by horse serum.

The phenomenon induced by a second injection is followed, in certain cases, by an immunity to the corresponding infection.

These results give a possible explanation of the period of incubation in some of the communicable diseases. Is it a coincidence that the period of incubation in a number of infectious diseases is about ten to fourteen days, which corresponds significantly with the time required to sensitize animals with a strange proteid? In certain infectious diseases with a short period of incubation, such as pneumonia, the crisis, which commonly appears in about ten days, may find a somewhat similar explanation. It is evident that diseased processes produced by soluble toxines, such as diphtheria and tetanus, do not belong to the category now under consideration.

The phenomenon of hypersusceptibility has been produced in the guinea pig by extracts obtained from the colon bacillus, yeast, hay bacillus, anthrax, tubercle bacillus, and the typhoid bacillus. The hypersusceptibility produced by the colon and typhoid bacillus was followed by a definite immunity to the corresponding infections. In the case of anthrax, however, immunity does not follow hypersusceptibility to the anthrax proteid. We are, therefore, not dealing with a general law applicable to all infections, but with certain limitations as in the case of antitoxic immunity.

NOTICE TO LIBRARIANS AND BIBLIOGRAPHERS CONCERNING THE SERIAL PUBLICATIONS OF THIS LABORATORY.

The Hygienic Laboratory was established in New York, at the Marine Hospital on Staten Island, August, 1887. It was transferred to Washington, with quarters in the Butler Building, June 11, 1891, and a new laboratory building, located in Washington, was authorized by act of Congress March 3, 1901.

The following *bulletins* [Bulls. Nos. 1–7, 1900 to 1902, Hyg. Lab., U. S. Mar.-Hosp. Serv., Wash.] have been issued:

No. 1.—Preliminary note on the viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 2.—Formalin disinfection of baggage without apparatus. By M. J. Rosenau.

No. 3.—Sulphur dioxid as a germicidal agent. By H. D. Geddings.

No. 4.—Viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 5.—An investigation of a pathogenic microbe (*B. typhi murium* Danyz) applied to the destruction of rats. By M. J. Rosenau.

No. 6.—Disinfection against mosquitoes with formaldehyd and sulphur dioxid. By M. J. Rosenau.

No. 7.—Laboratory technique: Ring test for indol, by S. B. Grubbs and Edward Francis; Collodium sacs, by S. B. Grubbs and Edward Francis; Microphotography with simple apparatus, by H. B. Parker.

By act of Congress approved July 1, 1902, the name of the "United States Marine-Hospital Service" was changed to the "Public Health and Marine-Hospital Service of the United States," and three new divisions were added to the Hygienic Laboratory.

Since the change of name of the Service the bulletins of the Hygienic Laboratory have been continued in the same numerical order, as follows:

No. 8.—Laboratory course in pathology and bacteriology. By M. J. Rosenau. (Revised edition March, 1904.)

No. 9.—Presence of tetanus in commercial gelatin. By John F. Anderson.

No. 10.—Report upon the prevalence and geographic distribution of hookworm disease (uncinariasis or anchylostomiasis) in the United States. By Ch. Wardell Stiles.

No. 11.—An experimental investigation of *Trypanosoma lewisi*. By Edward Francis.

No. 12.—The bacteriological impurities of vaccine virus; an experimental study. By M. J. Rosenau.

No. 13.—A statistical study of the intestinal parasites of 500 white male patients at the United States Government Hospital for the Insane; by Philip E. Garrison, Brayton H. Ransom, and Earle C. Stevenson. A parasitic roundworm (*Agamomermis culicis* n. g., n. sp.) in American mosquitoes (*Culex sollicitans*); by Ch. Wardell Stiles. The type species of the cestode genus *Hymenolepis;* by Ch. Wardell Stiles.

No. 14.—Spotted fever (tick fever) of the Rocky Mountains; a new disease. By John F. Anderson.

No. 15.—Inefficiency of ferrous sulphate as an antiseptic and germicide. By Allan J. McLaughlin.

No. 16.—The antiseptic and germicidal properties of glycerin. By M. J. Rosenau.

No. 17.—Illustrated key to the trematode parasites of man. By Ch. Wardell Stiles.

No. 18.—An account of the tapeworms of the genus *Hymenolepis* parasitic in man, including reports of several new cases of the dwarf tapeworm (*H. nana*) in the United States. By Brayton H. Ransom.

No. 19.—A method for inoculating animals with precise amounts. By M. J. Rosenau.

No. 20.—A zoological investigation into the cause, transmission, and source of Rocky Mountain "spotted fever." By Ch. Wardell Stiles.

No. 21.—The immunity unit for standardizing diphtheria antitoxin (based on Ehrlich's normal serum). Official standard prepared under the act approved July 1, 1902. By M. J. Rosenau.

No. 22.—Chloride of zinc as a deodorant, antiseptic, and germicide. By T. B. McClintic.

No. 23.—Changes in the Pharmacopœia of the United States of America. Eighth Decennial Revision. By Reid Hunt and Murray Galt Motter.

No. 24.—The International Code of Zoological Nomenclature as applied to medicine. By Ch. Wardell Stiles.

No. 25.—Illustrated key to the cestode parasites of man. By Ch. Wardell Stiles.

No. 26.—On the stability of the oxidases and their conduct toward various reagents. The conduct of phenolphthalein in the animal organism. A test for saccharin, and a simple method of distinguishing between cumarin and vanillin. The toxicity of ozone and other oxidizing agents to lipase. The influence of chemical constitution on the lipolytic hydrolysis of ethereal salts. By J. H. Kastle.

No. 27.—The limitations of formaldehyde gas as a disinfectant with special reference to car sanitation. By Thomas B. McClintic.

No. 28.—A statistical study of the prevalence of intestinal worms in man. By Ch. Wardell Stiles and Philip E. Garrison.

No. 29.—A study of the cause of sudden death following the injection of horse serum. By M. J. Rosenau and John F. Anderson.

No. 30.—I. Maternal transmission of immunity to diphtheria toxin. II. Maternal transmission of immunity to diphtheria toxin and hypersusceptibility to horse serum in the same animal. By John F. Anderson.

No. 31.—Variations in the peroxidase activity of the blood in health and disease. By Joseph H. Kastle and Harold L. Amoss.

No. 32.—A stomach lesion in guinea pigs caused by diphtheria toxine and its bearing upon experimental gastric ulcer. By M. J. Rosenau and John F. Anderson.

No. 33.—Studies in experimental alcoholism. By Reid Hunt.

No. 34.—I. *Agamofilaria georgiana* n. sp., an apparently new roundworm parasite from the ankle of a negress. II. The zoological characters of the roundworm genus *Filaria* Mueller, 1787. III. Three new American cases of infection of man with horse-hair worms (species *Paragordius varius*), with summary of all cases reported to date. By Ch. Wardell Stiles.

No. 35.—Report on the origin and prevalence of typhoid fever in the District of Columbia. By M. J. Rosenau, L. L. Lumsden, and Joseph H. Kastle. (Including articles contributed by Ch. Wardell Stiles, Joseph Goldberger, and A. M. Stimson.)

No. 36.—Studies upon hypersusceptibility and immunity. By M. J. Rosenau and John F. Anderson.

In citing these bulletins, beginning with No. 8, bibliographers and authors are requested to adopt the following abbreviations: Bull. No. ——, Hyg. Lab., U. S. Pub. Health & Mar.-Hosp. Serv., Wash., pp. ——.

MAILING LIST.

The Service will enter into exchange of publications with medical and scientific organizations, societies, laboratories, journals, and authors. Its publications will also be sent to nonpublishing societies and individuals in case sufficient reason can be shown why such societies or individuals should receive them. All applications for these publications should be addressed to the "Surgeon-General, U. S. Public Health and Marine-Hospital Service, Washington, D. C."

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TREASURY DEPARTMENT

Public Health and Marine-Hospital Service of the United States

WALTER WYMAN, Surgeon-General

HYGIENIC LABORATORY.—BULLETIN No. 37

M. J. ROSENAU, Director

June, 1908

INDEX-CATALOGUE OF

MEDICAL AND VETERINARY ZOOLOGY

SUBJECTS:

TREMATODA AND TREMATODE DISEASES

BY

CH. WARDELL STILES

AND

ALBERT HASSALL

WASHINGTON

GOVERNMENT PRINTING OFFICE

1908

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United States Public Health and Marine-Hospital Service.

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INDEX-CATALOGUE OF MEDICAL AND VETERINARY ZOOLOGY.

SUBJECTS: TREMATODA AND TREMATODE DISEASES.

By CH. WARDELL STILES, Ph. D.,

Chief of Division of Zoology, Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service, Consulting Zoologist, U. S. Bureau of Animal Industry,

and

ALBERT HASSALL, M. R. C. V. S.,

Assistant, Division of Zoology, U. S. Bureau of Animal Industry,

Collaborators: O. B. Clevenger, P. E. Garrison, J. Goldberger, H. W. Graybill, M. G. Motter, C. Myers, B. and E. Oberly, C. A. Pfender, B. H. Ramson, E. and A. Stevenson, D. G. Willets.

INTRODUCTION.

The Index-Catalogue of Medical and Veterinary Zoology represents the combined card-catalogues of the Zoological Division of the United States Bureau of Animal Industry and of the Zoological Division, Hygienic Laboratory, United States Public Health and Marine-Hospital Service. These catalogues are arranged in three sections: Authors, Subjects, and Hosts.

OBJECT OF INDEX CATALOGUE.—The object in publishing the catalogue is to place it in permanent form. There have been four fires in the two laboratory buildings, but fortunately none of these gained headway. Were either building to be destroyed, and any part of the catalogue to be lost, the inconvenience such loss would entail in the regular work would be very extensive. By having the catalogue in printed form, it is made more accessible, and accidents are guarded against. By placing it at the disposal of other workers it is hoped to render their work less arduous, and especially it is desired to reduce the confusion in nomenclature.

SUGGESTIONS FOR USING THE INDEX.—It should be recalled that this is an index, not a treatise. Persons who consult it should therefore not expect to find in it the reasons for any given entry. Nor

does the entry of the synonymy in any given case mean that this synonymy is necessarily correct; it is simply quoting published synonymy. The same statement refers to the hosts cited.

In looking up the literature of any given species, the reader should consult the cross reference (pp. 10 to 83) for the various genera under which the species has been published, and the synonyms given in the general entries; by looking up these references in the general catalogue (pp. 84 to 383), all or practically all the references to the species are obtained.

SUGGESTIONS IN PUBLISHING NEW NAMES.—In indexing literature, one is impressed with the differences in arrangement of the material as published by different authors. Some writers arrange the systematic portions of their papers in such a manner that it is an easy matter to obtain the important data. Other authors are less careful in this respect, and their material is arranged, in some cases, in a style which almost defies indexing.

As a very convenient style we would suggest the following diagrams:

Genus FASCIOLA Linnæus, 1758.

1758: *Fasciola* Linn., 1758a, 644, 648–649 (*hepatica* [give here either the type species or all of the species in the order given by the author]). [Give origin of name, if desired.]

[Give here the synonymy in same style as foregoing entry.]

GENERIC DIAGNOSIS.—*Fasciolidæ*, *Fasciolinæ* [It is always very useful to give the name of the family and subfamily]: [Here give the generic diagnosis.]

TYPE SPECIES.—[If type has not been designated, state why the species in question is now selected; as by first species rule, tautonomy, elimination, etc.]

Species FASCIOLA HEPATICA Linnæus, 1758.

1758: *Fasciola hepatica* Linn., 1758a, 648–649 [add here type host and type locality].

[Add synonymy here, in same style as foregoing entry.]

SPECIFIC DIAGNOSIS.—*Fasciola* (p. —) [give page where generic diagnosis is printed]: [Add here specific diagnosis.]

HABITAT.—[Give hosts and geographic distribution here.]

TYPE SPECIMEN.—[Give museum number of type specimen.]

A list of hosts, together with the parasites found in them, is an exceedingly useful adjunct to any paper dealing with parasites. Several authors have published such lists, but most authors fail to do so. If the plan of giving a compendium of hosts with every paper were more generally adopted, the papers would be very much more valuable. In indexing the hosts, especially in papers by certain authors, we have met with considerable difficulty, for it is often necessary to read carefully an entire article in order to avoid overlooking the hosts. And even then it is, unfortunately, not exceptional that the reader can not be certain that he is indexing correctly.

ABBREVIATIONS.

As a general rule we do not favor the use of abbreviations. In a work of this kind, however, in which certain names are repeated from 50 to 2,000 times, the use of abbreviations becomes necessary, in order to reduce both the bulk and the expense.

GENERIC NAMES.—The general rule is here followed of abbreviating all generic names ending in *-stoma* or *-stomum* to *-st*, as *Amphist.* for *Amphistoma* and *Amphistomum*, *Dist.* for *Distoma* and *Distomum*, etc.

All names ending in *-cercaria* are abbreviated to *-cerc.*, as *Cerc.* for *Cercaria*, *Eucerc.* for *Eucercaria*, etc.

All other abbreviations can, we believe, be understood without explanation—*Fasc.* for *Fasciola*, *Plan.* for *Planaria*, etc.

AUTHORS' NAMES.—The following abbreviations refer to authors' names:

Abildg. for Abildgaard.
Ben. for Beneden.
Bettend. for Bettendorf.
E. Bl. for E. Blanchard.
R. Bl. for R. Blanchard.
Blainv. for Blainville.
Brand. for Brandes.
Burm. for Burmeister.
Cerf. for Cerfontaine.
Crep. for Creplin.
Cuv. for Cuvier.
Dav. for Davaine.
Dies. for Diesing.
Duj. for Dujardin.
Erc. for Ercolani.
Fil. for Filippi.
Fischder. for Fischœder.
Fraip. for Fraipont.
Gamb. for Gamble.
Gerv. for Gervais.
Goldb. for Goldberg.
Hass. for Hassall.
Jægers. for Jægerskiœld.
Kath. for Kathariner.
Kholodk. for Kholodkowski.
Kowal. for Kowalewski.
Kuech. for Kuechenmeister.
Leuck. for Leuckart.
Levin. for Levinsen.
Linn. for Linnæus.
Linst. for Linstow.
Lint. for Linton.
Lœnnb. for Lœnnberg.
Mol. for Molin.
Mont. for Monticelli.
Moul. for Moulinié.
Mueh. for Muehling.
Nord. for Nordmann.
Odhn. for Odhner.
Olss. for Olsson.
Pag. for Pagenstecher.
Par. for Parona.
Per. for Perugia.
Perr. for Perroncito.
Poir. for Poirier.
St.-Remy for Saint-Remy.
Sieb. for Siebold.
Sons. for Sonsino.
Staff. for Stafford.
Stoss. for Stossich.
Rail. for Railliet.
Rud. for Rudolphi.
Tasch. for Taschenberg.
Will.-Suhm for Willemoes-Suhm.

OTHER ABBREVIATIONS.—All literature references are taken from the Author's Catalogue of this Index (Bull. 39, U. S. Bureau of Animal Industry). The following common abbreviations are also used:

f. for family.
g. for genus.
m. for monotypical.
t. h. for type host.
t. l. for type locality.
tld. for type by later designation.
tod. for type by original designation.
subf. for subfamily.
subg. for subgenus.

ALPHABETICAL LIST OF SPECIFIC AND SUBSPECIFIC NAMES IN TREMATODA.

The following is a complete list of all the specific and subspecific names of *Trematoda*, so far as contained in our card catalogue at date of going to press, together with the generic names with which they have been used. The references are the earliest reference we have found for the names in question, together with the type host and type locality, so far as we have as yet traced these.

It has been found necessary to include in this list some species which are not *Trematoda*. (See addenda, p. 385.)

abbreviata Olss., 1876, 12, t. h. Acanthias vulgaris.—1876: Onchocotyle. 1899: Squalonchocotyle.

abbreviatum Brand., 1888a, 55, t. h. Crocodilus; Brazil.—1888: Diplost.

abdominalis Gœze, 1782a, 41, F. intestinalis Linn., 1758a, renamed, includes also Ligula piscium.—1782: Fasc. [Ligula, cestode.]

aberrans Goto, 1894a, 198, t. h. Belone schismatorhynchus; Hagi, Japan.—1894: Axine.

aberrans Looss, 1902m, 630, t. h. Chelone mydas; Egyptian coast.—1902: Microscaphidium.

absconditus Looss, 1901e, 631, t. h. Bagrus bayad, B. docmac.—1901: Acanthochasmus.

acalepharum Costa (1864), 90, larva in Acalephen.—1864: Macrurochæta (type) [1894: Cerc. setifera.]

acanthocephalum Stoss., 1887, 94, t. h. Belone acus; Triest.—1887: Dist. 1898: Echinost. 1899: Tergestia (probably type)

acanthoides Rud., 1819a, 114, t. h. Phoca vitulina; Berlin.—1819: Dist. (Echinost.). 1860: Echinost.

acanthurum Par. & Per., 1896, 2, t. h. Brama rayi; Genova.—1896: Microcotyle.

acanthus Nicoll, 1906, 514, t. h. Larus argentatus.—1906: Zeugorchis, type. 1907: Parorchis, type.

acariæum Looss, 1902m, 415, t. h. Thalassochelys corticata; Egyptian coast.—1902: Enodiotrema.

acceptum Looss, 1901b, 203, t. h. Crenilabrus pavo, C. griseus, bladder; Triest.—1901: Phyllodist.

acerca Biehringer, 1884a, 3, t. h. Onchidium carpenteri Stearns.—1884: Cerc.

acerinæ cernuæ Claparède (1857), t. h. Acerina cernua.—1857: Tetracotyle.

acervo-calcaphorum Erc., 1881e, 21, for acervocalciferum (Dist.).

acervocalciferum Gastaldi, 1854, 6, t. h. Rana esculenta.—1854: Dist.

acervocalcoforum Linst., 1875, 193, for acervocalciferum (Dist.).

acervocalcophorum Erc., 1881c, 20, for acervocalciferum (Dist.).

acetabularis Braun, 1900, 388, for acetabulatus (Pycnoporus).

acetabulatus Looss, 1899b, 611, t. h. Vesperugo kuhli; apparently Egypt, January.—1899: Pycnoporus.

acquans Sons., 1891, 263, for æquans (Diplectanum).

acreatum Stoss., 1892, 18, for ocreatum (Monost.).

actæonis Pag., 1862, 306, t. h. Acteon viridis; Cette.—1862: Dist.

aculcata Erc., 1881, see Par., 1894, 163, t. h. Lymnæa auricularis; Bologna.—Cerc.

aculeatum Nitzsch, in Giebel, 1857, 266, t. h. Strix bubo.—1857: Dist.

aculeatum Linst., 1879b, 338, t. h. Testudo græca; loc. not given.—1879: Monost. [1890: Dist. linstowii.] 1901: Telorchis.

aculeatum Par. & Per., 1889, 745, t. h. Corvina nigra; Genova.—1889: Diplectanum.

aculeatum Couch, ——.—: Trist. [1898: T. molæ.]

aculeatus Odhn., 1905, 297, t. h. Conger vulgaris; Mediterranean, Belgium, Sweden.—1905: Prosorhynchus.

aculeatus Dies., 1858, 275, t. h. Planorbis marginatus.—1858: Bucephalus (Bucephalopsis).

acuta Goto, 1894a, 217, t. h. Thynnus sibi; Hagi, Osatsubé, Japan, August.—1894: Hexacotyle.

acutum Leuck., 1842, 33, t. h. Mustela putorius.—1842: Dist.

adhærens Braun, 1901, 942, t. h. Mycothera sp.; Brazil.—1901: Glaphyrost. (type).

adhærens Looss, 1901, 624 (= vallei 1899, type of Lophotaspis), t. h. Thalassochelys corticata; Egypt.—1901: Lophotaspis (type).

adolphi Stoss., 1902, 19, t. h. Grus cinerea, Ardea cinerea; Siberia.—1902: Cyclocœlum.

[*adriaticum* v. Dr. (Dist. [tunicate].)]

aduncum Lint., 1905, 327, t. h. Opsanus tau; Beaufort, N. C.—1905: Dist.

advena Duj., 1843, 338, t. h. Sorex; Europe.—1843: Brachylaima (type). [1845: Dist. (Brachylaimus, type).] [1847: Brachylæmus.] 1892: Dist. [Brachylaimus (type).]

æglefini Mueller, 1776, 224, t. h. Gadus æglefinus, int.—1776: Fasc. 1803: Dist. [1850: Dist. simplex.] [1904: Sinistroporus (type).]

æglefini Ben., 1870, 57 [see also æglefini Mueller, 1776].—1870: Dist.

ægrefini Bosc., 1802a, v. 1, for æglefini 1776 (Fasc.).

ægyptiaca Odhn., 1905, 370, Monost. verrucosum of Looss, renamed.—1905: Notocotyle.

ægyptiacum Cobbold, 1876t, 757, t. h. Equus; Egypt.—1876: Diplost. 1876: Hemist. 1893: Gastrodiscus.

ægyptiacum Looss, 1896b, 33, t. h. buffles, bœufs, moutons; Egypt.—1896; Dist. 1896: Dist. hepaticum. 1898: Fasc. hepatica. 1899: Fasc. [1902: F. gigantea.]

ægyptiaca Cobbold, 1866, 6, heterophyes 1852, renamed.—1866: Heterophyes (type).

ægyptiacus Looss, 1898a, 459, apparently lapsus for gregarius.—1898: Gastrothylax.

æquale Duj., 1845a, 410, t. h. Strix flammea; Rennes.—1845: Dist. (Brachylaimus). 1892: Mesogonimus. [1899: Clinost. ("possibly").]

æqualis Looss, 1902, 888, t. h. dogs and cats; Egypt.—1902: Heterophyes.

æquans Wagener, 1857, 99, t. h. Labrax lupus.—1857: Dactylogyrus. 1858: Diplectanum (probably type).

æquans Looss, 1899b, 652, t. h. Gerbillus ægyptius; Egypt.—1899: Heterolope. 1900: Harmost.

æquatus Staff., 1905, 691, t. h. Eutenia sirtalis; Canada.—1905: Zeugorchis (type).

affine Dies., 1850a, 410, based on Schmitz, 1826, 15, figs. 1–13, t. h. Bombinator igneus; Berlin.—1850: Hexathyridium.

affine Dies., 1850a, 359 [not Rud., 1819a], Monost. tenuicolle Rud., 1819a, renamed, t. h. Lampris guttatus; Groningæ.—1850: Dist.

affine Leidy, 1858a, 110, t. h. Fiber zibethicus; U. S. A.—1858: Monost.

affine Rud., 1819a, 110, t. h. Perca cirrosa; Arimini.—1819: Dist. 1845: Dist. (Apoblema). 1901: Derogenes.

affine Lint., 1898, 511, t. h. Paralichthys dentatus; Woods Hole.—1898: Octoplectanum. 1901: Diclidophora.

affinis Eichwald, 1829a, 247, t. h. Lymnæus stagnalis.—1829: Cerc.

affixus Looss, 1899b, 587, t. h. Corvus cornix, Falco tinnunculus, Circus æruginosus, Recurvirostra avocetta; Egypt.—1899: Pygorchis (type).

africanum Stiles, 1901, 594, bursicola Looss, 1899 [not Crep., 1837], renamed.—1901: Echinost.

africanum Stoss. in Galli-Valerio, 1906, 49, t. h. a fish; French Congo.—1906: Clinost.

agamos Linst., 1872, 1, t. h. Gammarus pulex L.—1872: Dist.

agassizi Goto, 1899a, 286, t. h. Remora brachyptera; Newport, R. I.—1899: Dionchus (type).

agassizii Mont., 1905, 69, for agassizi (Dionchus).

agilis Fil., 1857c, 4, t. h. Lymnæus stagnalis; Turin.—1857: Cerc. 1858: C. (Gymnocephala).

agilis Leidy, 1858a, 110, free in Delaware River.—1859: Cerc.

alaeve Looss, 1901, 401, t. h. Labrus maculatus, L. merula, Crenilabrus pavo, C. quinquemaculatus, C. griseus.—1901: Dist.

alata Gœze, 1782a, 176, t. h. Canis vulpes; Germany.—1782: Plan. [1788: Alaria vulpis, type]. 1790: Festuc. 1793: Fasc. 1800: Dist. 1819: Holost. 1850: Hemist. (type). 1889: Emist. 1894: Diplost. (Hemist.). 1896: Conchosomum (type).

alata Hemp. & Ehrenb., 1828a, in water; Berlin.—1828: Histrionella. 1856: Cerc.

alatus Linst., 1878, 227, t. h. Blicca bjœrkna; Europe.—1878: Dactylogyrus.

alba Erc., 1881c, 12, for Cerc. brunnea var. Dies.—1881: Cerc.

alba Cerf., 1899a, 377, t. h. Raja alba.—1899: Rajonchocotyle.

albicolle Rud., 1819a, 98, t. h. Falco pennatus; Mus. Vien.—1819: Dist. 1845: D. (Dicrocœlium). 1901: Dicrocœlium.

albidum Braun, 1893, 347, t. h. Felis catus domestica; Kœnigsberg i. Pr.—1893: Dist. (Dicrocœlium). 1896: Opisthorchis. 1899: Metorchis (type).

albidum Brand., in Ofenheim, 1900, 145, t. h. Aëtobatis narinari; Pacific.—1900: Anaporrhutum (type).

albocæruleum Stoss., 1889, 28, t. h. Sargus salviani; Triest.—1889: Dist.

album Kuhl & van Hasselt, 1822a; 1824a, 311 t. h. Chelonia midas; Iles des Cocotiers.—1822: Monost. 1899: Cricocephalus (type).

album Stoss., 1890, 42, t. h. Cantharus orbicularis; Triest.—1890: Dist. [1899: ? Creadium.] 1904: Lepocreadium (type). 1901: Allocreadium.

alcedinis Par. & Per., 1890, 7, t. h. Smaris alcedo; Geneva.—1890: Microcotyle.

allostomum Dies., 1850a, 367, Dist. colubri murorum 1811 and 1819 renamed, t. h. Tropidonotus natrix; M. C. V.—1850: Dist.

alosæ Hermann, 1782, 180, t. h. Clupea alosa.—1782: Mazocraes (type).

alosæ Hermann, 1783a, 46, t. h. Maifisch im Rhein, Clupea alosa.—1783: Fasc. [1850: Dist. appendiculatum.]

alosæ Leuck. (1828) [see lanceolatum].—Octobothrium. [1845: O. lanceolatum.]

alosæ Mont., 1888, 13.—1888: Ophycotyle.

alosæ Kuhn 1829, 358, t. h. Clupea alosa.—1829: Octost. (type). [1852: Octobothrium lanceolatum.]

alosæ Mayer, 1841a, see lanceolatus alosæ.

alosæ Ben. & Hesse, 1863; 1864, 102, t. h. Alosa vulgaris.—1864: Glossocotyle (type). 1890: Octobothrium (Glossocotyle).

aloysiæ Stoss., 1885, 161, t. h. Corvina nigra; Triest.— 1885: Dist. 1886: D. (Brachylaimus). [1899: Anoiktost., type.]

alpina Dana.—1891: Plan.

altemon Ben., 1870, 48, see atomon (Dist.).

aluconis intestinale Rud., 1819a, 119, t. h. Strix aluco.—1819: Dist. [1892: sub Echinost. apiculatum.]

aluconis thoracicum Rud., 1819a, 119 (Plan. pusilla Braun, 1790, pro parte renamed); t. h. Strix aluco.— 1819: Dist.

alveatum Mehlis, in Crep., 1846, 142, t. h. Anas, Cygnus, see p. 323.—1845: Monost. 1892: Notocotyle.

alveatum Mehlis of Much., 1898, renamed alveiforme Cohn, 1904.

alveiforme Cohn, 1904, 230, alveatum Mehlis of Much., 1898, renamed.—1904: Monost.

americana Hass., 1891c, 359, t. h. Bos taurus; U. S. A.; carnosa Hass., 1891, renamed.—1891: Fasc. 1892: Dist. [Fasc. magna.]

americanus Staff., 1902, 719, t. h. Rana virescens; Ashbridge's Bay, Toronto.—1905: Cephalogonimus.

americanum Osborn, 1903, 252, t. h. Amblystoma punctatum; Minnesota.—1903: Phyllodist.

amiuri Staff., 1904, 402, t. h. Amiurus nebulosus; Canada.—1904: Monost.

amphibothrium Wagener, 1857, 57, t. h. Acerina cernua.—1857: Dactylogyrus.

amphielucus Looss, 1899b, 565, for amphileucus (Metorchis).

amphileucum Looss, 1896b, 55, t. h. Naja haje; Alexandria, Egypt.—1896: Dist. 1898· Opisthorchis. 1899: Metorchis.

amphiorchis Braun, 1899b, 719, t. h. Thalassochelys corticata at Triest, Chelone mydas and Podocnemis expansa.—1899: Dist. 1899: Anadasmus (type). [1901: Orchidasma (type).] 1901: Orchidasma (type).

amphistoma Nord., 1840, 616, probably lapsus (D[istoma]).

amphistomi subclavati Ben., 1858a, 82, in Cyclas cornea, etc.—1858: Cerc. [1859: Diplodiscus subclavatus.]

amphistomoides Bojanus, 1817b, 270, t. h. Castor fiber.—1817: Dist. 1817: Dystoma. [1850: Amphist. subtriquetrum.] [1902: Cladorchis (Stichorchis) subtriquetrus.]

amplicava Looss, 1899b, 606, D. cygnoides var. A. of Bensley, 1897, renamed.—1899: Gorgodera.

ampullaceum Buttel-Reepen, 1900, 586, in Cetacean; Indian Ocean.—1900: Dist.

anarhichæ Jacoby, 1900, 13, for anarrhichæ.—1900: Dist.

anarrhichæ Rud., 1819a, 121; anarrhichæ lupi Rathke, pars (from intestine) renamed.—1819: Dist. [1819: ? D. appendiculatum.]

an[arrhichæ] lup[i] Rathke, 1799, 70, t. h. Anarrhichas lupus.—1799: Dist. [1809: D. incisum.]

anastrophus Fischder., 1901, 375, t. h. Cervus dichotomus; Brazil.—1901: Balanorchis (type).

anatinus Markow, 1902, 1903a, 287, t. h. Anas boschas dom.—[1902: Prosthogonimus.] 1902: Prostogonimus.

anatis Schrank, 1788, xvi, 164, t. h. ducks.—1788: Festucaria [type]. 1790: Fasc. 1800: Dist. [1815: Monostomeus, type.] [1850: Dist. echinatum.] [1892: Echinost. echinatum.] [1901: ? Echinost. echinatum.]

anatis Rud., 1819a, 793, for anatis querquedulæ (Amphist.).

anatis domesticæ Rud., 1809a, 431 (Hirudo fasciolaris Mueller, 1788, Fasc. anatis Bruguière, 1791, renamed).—1809: Dist. [1850: Dist. ovatum.]

anatis fuscæ Viborg, 1795, 243, t. h. Anas fusca; Copenhagen.—1795: Dist.

anatis nigræ Dies., 1858e, 322, t. h. Anas nigra.—1858: Holost.

anatis querquedulæ Rud., 1819a, 92, t. h. Anas querquedula; Cat. Ent. Vien.—1819: Amphist.

anatis tadornæ Viborg, 1795, 196, t. h. Anas tadorna.—1795: Strigea. 1809: Amphist. [1814: A. isostomum.] [1845: Holost. erraticum.]

anceolatum Braun, 1892a, 677, misprint for lanceolatum (Dist.).

anceps Mol., 1859, 845, t. h. Fulica atra; Padua.—1859: Dist. 1892: Echinost.

anceps Looss, 1899b, 629, t. h. Machetes pugnax; Marg, April.—1899: Prymnoprion. 1901: Prosthogonimus. [1902: Pros. cuneatus.]

anchoratus Duj., 1845a, 480, t. h. "la carpe;" Europe.—1845: Gyrodactylus. 1857: Dactylogyrus. [1879: D. auriculatus.]

ancyli lacustris Dies., 1855a, 400, based on Baer, 1827b, 656, t. h. Ancylus lacustris.—1855: Dist. 1855: Cercariæum.

andersoni Cobbold, 1876, 46, t. h. Platanista gangetica.—1876: Dist. 1892: D. (Brachylaimus).

anellidicola Mont., 1888, 88, for annelidicola (Cyclatella).

anguillæ Gmelin, 1790a, 3056, t. h. Anguilla; refers to Leeuwenhoek, 316, fig. 6.—1790: Fasc. 1803: Dist. [1819: ? D. polymorphum.]

anguillulæ Dies., 1850a, 340, lapsus for anguillæ Abildg. and Zed.—1850: Dist.

anguis Linst., 1885, 250, t. h. Anguis fragilis.—1885: Dist. 1895: Agamodist.

angulata Mueller, 1774, 58, "in fundo arenoso oceani."—1774: Fasc. 1776: Planaria. ——: Amphiporus.

angulatum Duj., 1845a, 401 (not Fasc. angulata Mueller, 1776), t. h. Anguilla; Morbihan.—1845: Dist. (Podocotyle [type]). 1901: Podocotyle, type. [1905: see Podocotyle atomon.]

angusta Rail., 1895, 338, see hepatica angusta.—1895: Fasc. hepatica. 1899: Fasc. [F. gigantica.]

[*angusta* Muenster, 1842, 98.—Hirudinella. Hirudella. Leach.]

angusticolle Hausmann, 1896a, 391, t. h. Cottus gobio; Basel, Switzerland.—**1896**: Dist. 1899: Creadium. 1901: Allocreadium.

angustum Staff., 1900, 407, t. h. Chrysemys picta.—1900: Dist. 1905: Telorchis.

angustum Schlotthauber, 1860, 129, t. h. Scolopax gallinago.—1860: Monost.

aniarum Leidy, 1891a, 414, t. h. Tropidonotus sipedon.—1891: Dist.

annelidicola Ben. & Hesse, 1863, 1864a, 82, t. h. ? Clymene.—1863: Cyclatella (type). [1869: Loxosoma.]

annulatum Dies., 1850a, 386, t. h. Gymnotus electricus; Brazil.—1850: Dist. 1860: Echinost. 1892: Dist. (Echinost.).

annulicauda Bory, 1825b, 253.—1825: Histrionella.

annuligerum Nord., 1832, 53, t. h. Flussbarsch, Perca fluviatilis.—1832: Dist. 1886: D. (Brachylaimus).

anodontæ Osborn, 1898, 416, t. h. Unio luteolus, Anodonta; New York.—1898: Platyaspis. [1899: Cotylaspis insignis.]

anonymum Dies., 1858e, 341, based on Bellingham, 1844, 428, t. h. Gadus æglefinus, G. euxinus, Merlangus carbonarius, M. vulgaris; Ireland.—1858: Dist.

anseris Gmelin, 1790a, 3055; Fasc. verrucosa Frœlich, 1789, renamed; t. h. Anser domesticus, rectum; Europe.—1790: Fasc. [1850: Notocotyle seriale.] [1861: Monost. verrucosum.] [1905: Catatropis verrucosa, type.]

anthos Braun, 1899b, 720, t. h. Cheloniæ; Yedo.—1899: Dist. 1901: Calycodes (type).

anticum Staff., 1905, Apr. 11. 693, t. h. Vespertilio subtilis Say; Canada.—1905: Lecithodendrium.

apertum Rud., 1819a, 108, t. h. Apogon ruber s. Mullus imberbis; Naples.—1819: Dist. 1845: D. (Apoblema).

apiculata Rud., 1803, 31; D. stridulæ Reich, 1801, renamed.—1803: Fasc. 1809: Dist. (Echinost.). 1860: Echinost.

apiculatum Olss., 1869, 4, t. h. Acanthias vulgaris; Skagerrack.—1869: Microbothrium (type). 1890: Pseudocotyle.

apodis Packard, 1882, 142, in egg-sacks of Apus.—1882: Dist.

apolaimum Heymann, 1905, 91, t. h. Kachuga tectum (Gray) small int.—1905: Dist.

appendiculata Rud., 1802, 78, t. h. Clupea alosa, stomach; Europe.—1802: Fasc. 1808: Dist. [1809: Hemiurus (type).] 1845: Dist. (Apoblema [type]). 1847: Apoblema. 1896: Hemiurus (type).

appendiculata Frœlich, 1802, 56 (not Rud., 1802) t. h. Anas boschas; Europe; see papillatum Rud., 1814a, 105, renamed oxycephalum Rud., 1819a, 98, 375.—1802: Fasc. [1814: Dist. oxycephalum.] [1850: Dist. oxycephalum.]

appendiculata Leidy, 1877, 202, t. h. Helix arborea.—1877: Dist. [1891: D. centrappendiculatum.]

appendiculata Kuhn, (1829c), 460, t. h. Squalus catulus.—1829: Polyst. 1840: Hexabothrium (type). 1850: Onchocotyle (type). 1879: Hexathyridium. 1890: Octocotyle. 1899: Acanthonchocotyle (type).

apri Gmelin, 1790a, 3054, see hepatica apri.—1790: Fasc. hepatica.

aquilæ Leidy, 1887, 24, t. h. Haliaëtos leucocephalus.—1887: Dist.

arcanum Nickerson, 1900, Oct., 811, in frogs.—1900: Dist. 1902: Pleurogenes. 1905: Loxogenes (type).

arcticus Odhn., 1905, 339, t. h. Phoca barbata; Spitzbergen.—1905: Orthosplanchnus (type).

arcuata Steenstrup, see Par., 1894, 164, t. h. Lymnæa obscura, L. stagnalis; Bologna.—Cerc.

arcuata Sons., 1890, 112, t. h. Lichia amia; Pisa.—1890: Octocotyle. 1890: Octobothrium. [1890: Octocotyle striata.]

arcuatum Brand., 1892b, 507, t. h. in aquatic birds [probably Anas clangula; Berlin].—1892: Monost. [1892: Cyclocœlum.] 1902: Cyclocœlum.

arcuatum Duj., 1845a, 410, t. h. Corvus glandarius; Rennes.—1845: Dist. (Brachylaimus).

arcuatum Lint., 1900, 277, t. h. Sarda sarda; Woods Hole.—1900: Gasterost.

ardeæ Gmelin, 1790a, 3055, t. h. Ardea stellaris, int.; Europe; Planaria teres pars Goeze, 1782a, renamed.—1790: Fasc. 1803: Dist. ——: Planaria. [1850: Dist. ferox.]

ardeæ minutæ Pontallié, 1853.—Dist. (Cladocalium).

ardeæ nigræ Viborg (1795), see Rud., 1809a, index.—1795: Dist. [1809: D. hians.]

ardeæ stellaris Rud., 1809a, 432; Fasc. ardeæ Gmelin, 1790, renamed.—1809: Dist. [1850: D. ferox.]

arenula Crep., 1825a, 53, t. h. Fulica atra.—1825: Dist.

areolatum Rud., 1809a, 50, Fasc. platessæ Mueller, 1788, renamed; t. h. Pleuronectes platessa.—1809: Dist. 1886: D. (Echinost.).

aristotelis Stoss., 1892, 14, D. chilostomum Mehlis of Ben., 1873b, t. h. Rhinolophus hippocrepis, Vespertilio murinus, V. desycneme, V. daubentonii, V. emarginatus, V. mystacinus, Nannugo pipistrellus.—1892: Dist. 1892: D. (Brachylaimus).

armata Sieb., 1837, 187, based on Wagner, 1834, 131.—1837: Cerc. 1855: Cerc. (Xiphidiocerc.). 1858: C. (Acanthocephala). [1858: Dist. endolobum.]

armata Rud., 1793a, 26; Fasc. putorii Gmelin, 1790a, renamed.—1793: Fasc. 1803: Dist. [1850: Dist. trigonocephalum.] [?1892: Echinost. echinatum.]

armata minor Ben., 1858, 98, t. h. Lymnæus stagnalis; Belgium.—1858: Cerc. [1859: Dist. retusum.]

armatissimum Linst., 1903, 280, t. h. Iguana sp.—1903: Dist.

armatum MacCallum, 1895, 401, see isoporum armatum.—1895: Dist. isoporum. [See also Creadium.]

armatum Mayer, 1841, 4, Echinorhynchus renamed.—1841: Monost.

armatum Leuck., 1835, 88, t. h. Acipenser rostratus.—1835: Diclibothrium (type). 1835: Diclybothrium. 1842: Diplobothrium (type). 1845: Polyst. (Hexacotyle).

armatum Molin, 1858, 130 (not Rud. 1793), t. h. Phasianus gallus; Patavii.—1858: Dist. [1896: Echinost. echinatum.]

armatum Mol., 1859, 291, t. h. Conger conger; Batavii.—1859: Gasterost.

armatum Fuhrmann, 1904, 61, t. h. Rostrhamus sociabilis.—1904: Echinost.

armatum paludinæ impuræ Fil., 1857c, pl. 2, figs. 14–15.—1857: Dist.

arrectum Duj., 1845a, 403, t. h. "lézard vert;" Rennes.—1845: Dist. (Brachycœlium). 1895: D. (Dicrocœlium).

arrectum Duj., of Mol., 1859, 831, misdetermined.—1859: Dist. [1899: Telorchis.] 1904: Telorchis.

ascidia Rud., 1819a, 108, t. h. Sparus boops and S. pagrus; Arimini and Naples.—1819: Dist. 1903: D. (Brachylaimus).

ascidia Ben., 1873, 328, not Rud., 1819a; see lagena Brand., 1888, not Rud., 1819a.—1873: Dist. 1892: D. (Dicrocœlium). [1896: Lecithodendrium.] 1899: Lecithodendrium (type).

ascidiæ Dies., 1858e, 373, t. h. Mentula marina.—1858: Aspidogaster.

ascidioides Ben., 1873, 332, t. h. Vesperugo noctula.—1873: Dist. 1892: D. (Brachylaimus). 1899: Lecithodendrium. 1902: D. (Lecithodendrium). [1905: Lec. chilostomum Mehlis.]

ascoidea Leidy, 1877, 201, t. h. Planorbis parvus.—1877: Dist. (Gymnocephala).

asper Looss, 1899b, 601, separated from variegatus.—1899: Hæmatolœchus. 1905: Pneumonœces.

asperum Dies., 1838a, 189, t. h. Tapirus americanus; 1839, 236, Matogrosso and Cachœira do Bananeira, South America.—1838: Amphist. 1901: Cladorchis.

asperum Nitzsch, in Crep., 1849a, 71, t. h. Anas fuligula.—1849: Monost.

asperum Vaillant, 1863, 347, t. h. Siren lacertina.—1863: Monost. 1892: Monostomulum.

asperum Wright, 1879, 57, t. h. Ardea minor.—1879: Dist. 1892: Echinost. 1903: Pegosomum.

asperus Stoss., 1904, 1, t. h. Plecotus auritus; Grisignana, Istria.—1904: Plagiorchis.

aspidophori Ben., 1870, 34, t. h. Aspidophorus europæus.—1870: Dist.

assula Duj., 1845a, 398, t. h. Coluber natrix; Toulouse.—1845: Dist. (Dicrocœlium).

asymphyloporum Stoss., 1901, 96, t. h. Trutta trutta; Lake Plitvica, Croazia.—1901: Allocreadium.

atomata Bosc, 1802a, v. 1, 260.—1802: Planaria.

atomon Rud., 1802, 70, t. h. Pleuronectes flesus, stomach; Greifswald, Europe.—1802: Fasc. 1809: Dist. 1886: D. (Dicrocœlium). 1901: Allocreadium. 1905: Podocotyle (type).

atriventre Weinland, 1856, 24, t. h. Physa heterostropha.—1856: **Dist.**

attenuata Staff., 1902, 418, t. h. Rana catesbiana, R. virescens; **Canada.—1902: Gorgodera. 1905: Gorgoderina.**

attenuatum Rud., 1809a, 328, t. h. Scolopax gallinago; **Greifswald.—1809: Monost.** (Monost.). [Notocotyle verrucosum.]

attenuatum Rud., 1814a, 103, Fasc. longicollis Abildg., renamed; **later renamed Dist.** naja Rud., 1819a, 377.—1814: Dist.

attenuatum Duj., 1845a, 392 [nec Rud.], t. h. Turdus merula; **Rennes.—1845: Dist.** (Dicrocœlium). 1900: Dicrocœlium. [1850: D. macrourum.]

attenuatum Bremser, MS., in Braun, 1901f, 563, t. h. Rhynchops nigra; **Brazil.—1901:** Dist. [1901: Microlistrum spinetum.]

attenuatum Dies., 1836d, 238, t. h. Salmo paccu; **Caiçara, Brazil.—1836: Amphist.**

attenuatum Linst., 1906, 11, t. h. Buteo vulgaris.—1906: Hemist.

augusticaudum Staff., 1904, 488, t. h. Lota maculosa, Stitzostedion vitreum; **Canada.—**1904: Mimodist. (type).

augustus Staff., 1905, Apr. 11, 690, for angustum 1900.—1905: **Telorchis.**

aurantiaca Haswell, 1900, 431, t. h. Astacopsis sp.—1900: **Temnocephala.**

auricularis Wedl, 1857, for auriculatus (Gyrodactylus).

auriculata Bosc, 1802a, v. 1, 261.—1802: Planaria.

auriculatum Wedl, 1857, 242, t. h. Acipenser ruthenus.—1857: **Dist. 1886: D.** (Crossodera). 1903: Bunodera.

auriculatum Wedl of Lint., 1898, 521.—1898: Dist. [1904: Acrodactyla petalosa (type of A.).]

auriculatus Nord., 1832, 108, t. h. Cyprinus brama.—1832: **Gyrodactylus. 1850:** Dactylogyrus (type).

auriflavum Mol., 1859, 287, t. h. Ardea nycticorax; Batavii.—1859: **Diplost.**

auritum Duj., 1845a, 370, t. h. Strix flammea; Rennes.—1845: **Holost. 1850: Hemist.**

auris Tasch., 1879, 613, t. h. Auxis rochei; Naples.—1879: **Didymozoon.**

axenos Mont., 1898; or 1899, 83, t. h. unknown; Brazil.—1899: **Temnocephala.**

baccigerum Rud., 1819a, 108, t. h. Atherina hepsetus; Naples.—1819: **Dist.**

bacillare Mol., 1859, 834, t. h. Centrolophus pompilius; Batavii.—1859: **Dist. 1886:** D. (Dicrocœlium). [1899: Creadiinæ, ? Creadium.]

baculifer Braun., 1900, 28, t. h. Didelphys palmata; Brazil.—1900: **Rhopalias.**

baculum Lint., 1905, 327, t. h. Scomberomorus maculatus; **Beaufort, N. C.—1905:** Gasterost.

baculus Dies., 1850a, 391, D. mergi 1819 renamed, t. h. Mergus albellus.—1850: **Dist.** 1860: Echinost.

badia Rathke, 1799, 147.—1799: Plan.

baelzi Cobbold, 1884g, 976, D. pulmonale Baelz renamed, t. h. Homo.—1884: **Dist.** [Paragonimus, type].

bagri incapsulatum Wedl, 1861, 479, t. h. Bagrus sp.—1861: Dist.

baraldii Sons., 1892, 91, t. h. Zamenis viridiflavus Lacep.—1892: **Dist. 1895: D.** (Brachylaimus).

barbata Linn., 1761, 505, t. h. Loligo; Sweden.—1761: Fasc. [1779: **Echinorhynchus.**] 1809: Dist. [1809: Tetrabothriorhynchus migratorius, cestode.] [1819: Tetrarhynchus megabothrius.] 1853: Tetrabothriorhynchus. [1905: **Tetrarhynchus.**]

barbatum Cohn, 1902k, 47, t. h. Coryphæna.—1902: Lecithocladium. **1907: Dinurus.**

baryurum Staff., 1903, 822, t. h. Necturus maculatus Raf.; **Canada.—1903: Monocæcum** (type).

bathycotyle Fischder., 1901, 368, t. h. Bos kerabau; Ceylon.—1901: **Paramphist.**

batis Cerf., 1899a, 376, t. h. Raja batis.—1899: Rajonchocotyle (type).

batryophoron Ben., 1870, 51, for botryophoron (Dist.).

beleocephalum Linst., 1873, 104, t. h. Ardea cinerea.—1873: Dist. 1892: **Echinost.**

[*bellii*, reptile (Bucephalus).]

bellinghamii Cobbold, 1860a, 45, falconum Dies., renamed, t. h. Falco nisus, **F. rufus.—**1860: Holost.

bellones Otto, 1823, 300, t. h. Bellone acus; Naples.—1823: **Cyclocotyla (type).** 1837: Cyclocotyle (type). 1840: Octobothrium.

belones Nord., 1840, 600, for bellones Otto (Octobothrium).

belones Crep., 1839, 291, for bellones Otto (Cyclocotyla).

belones Braun, 1893, 871, t. h. Belones vulgaris; based on Wedl, 1855, 382-383.—1893: Dist.

belones Abildg., 1794d, 59, t. h. Belone acus.—1794: Axine (type).

belones vulgaris Dies., 1855, 64, t. h. Belone vulgaris; Triest; based on Wedl, 1855, 382-383.—1855: Dist.

benedeni St.-Remy, 1898, 566, for van benedeni.—1898: Dactylogyrus.

benedeni Stoss., 1898, 51, for benedenii.—1898: Dist. 1902: Haploporus (type).

benedeni Mont., 1893, see benedenii.—1904: Nematobothrium (Didymozoon).

benedeni St.-Remy, 1898, 566, for van benedenii (Tetraonchus).

benedenii Stoss., 1887, 95, t. h. Mugil chelo.—1887: Dist. 1902: Haploporus (type).

benedenii Mont., 1893, 137, t. h. Orthagoriscus.—1893: Didymozoon.

bergense Olss., 1868, 43, t. h. Anguilla vulgaris.—1868: Dist. 1886: D. (Brachylaimus) [1905: Lecithaster gibbosus.]

bergi Par., 1900, 193, t. h. Raja planata; Montevideo.—1900: Fasc.

beroës Will, 1844, 343, t. h. Beroës rufescens; Triest.—1844: Dist. [1850: D. papillosum.]

betencourti Mont., 1892b, 127; 1893, 33, t. h. Scyllium; Boulogne.—1893: Dist. 1899: Pleurogenes.

bicornis Bosc., 1802a, v. 1, 257.—1802: Plan.

bicoronatum Stoss., 1883, 113, t. h. Ciconia nigra.—1883: Dist. 1886: D. (Echinost.). 1901: Stephanochasmus. 1902: Echinost.

bifasciata Haswell, see Mont., 1889, 2.—1889: Temnocephala.

bifurcatum Wedl, 1861, 477, t. h. Crocodilus vulgaris; Egypt.—1861: Dist. 1888: Diplost.

bifurcum Braun, 1899, 631, t. h. Flussschildkröten.—1899: Dist. 1901: Telorchis.

bijugum Braun, 1901g, 896, t. h. Himantopus melanopterus; Brazil.—1901: Stomylotrema.

bijugum Miescher, (1838a), pp. 28, 1 pl., t. h. Fringillidæ.—1838: Monost. [1840] Monost. faba.]

[bilamellatæ, see sub Fasc.]

bilharzii Herff, 1894, 415, for hæmatobium.—1894: Dist. [Schistosoma.]

bilineata Haldeman, 1840a, 3, t. h. Limnea catascopium; Camden on Delaware.—1840: Cerc. 1850: Histrionella.

biliosum Leidy, 1858, 111, in a fish; America.—1858: Dist.

bilis Braun, 1790, 61, t. h. Falco melanaëtus; Germany.—1790: Plan. 1790: Fasc. 1803: Dist. [1809: Dist. crassiusculum.] 1898: Campula.

billis Bosc, 1802a, v. 1, 269, for bilis 1790 (Fasciola).

bilobum Rud., 1819a, 114, t. h. Tantalus falcinellus; Mus. Vien.—1819: Dist. (Echinost.) 1860: Echinost.

bilobus Looss, 1901, 569, t. h. Chelone mydas; Egypt.—1901: Pleurogonius.

binodis Mueller, 1776, 224, in intest. of fish.—1776: Fasc. 1803: Dist.

biparasiticum Goto, 1894a, 251, t. h. Parapetalus, Thynnus albacora; Japan.—1894: Trist.

bipartita Sons., 1897, 253, t. h. Limnæa palustris; Pisa.—1897: Cerc.

bipartitum Wedl, 1855, 378, t. h. Thynnus vulgaris.—1855: Monost. 1860: Wedlia (type). [1878: Didymozoon (type).] 1893: Dist. 1902: Didymost. (type).

birói Mont., 1905, 21, t. h. Sesarma gracilipes A. Edw.; Sattelberg, New Guinea.—1905: Craniocephala (type).

blainvillei Cobbold, 1860a, 39, M. delphini Blainv., renamed.—1860: Monost.

blanchardi, Stoss., 1898, 61, t. h. Labrax lupus; Triest.—1898: Gasterost.

blanchardi Tasch., 1878, 564, for blanchardii (Trist.).

blanchardi Haswell, 1893f, 153, corrigendum, t. h. Engæus fossor; Grippsland, Victoria, Australia.—[1893: Actinodactylus.] 1893: Actinodactylella.

blanchardii Cobbold, 1860a, 8, Brachylæmus erinacei Bl., 1847, renamed, t. h. Erinaceus europæus; Paris.—1860: Dist. [1892: D. linguæforme.]

blanchardii Dies., 1850a, 430, T. squali E. Bl., 1847, renamed, t. h. Squalus sp.; New Zealand.—1850: Trist.

blennii Mueller, 1776, 224, t. h. Blennius viviparus.—1776: Fasc. 1803: Dist. [1809: D. divergens.]

bliccæ Linst., 1877, 185, t. h. Blicca bjoerkna.—1877: Dist.

bolodes Braun, 1902b, 11, t. h. Fulica atra; Rossitten.—1902: Dist.

bombynæ Zed., 1800a, xvi, t. h. Rana bombyna, lungs; Europe.—1800: Monost. [1894: Dist. variegatum.]

bomfordi Montgomery, 1906, 143, t. h. Bos indicus; India.—1906: Schistosoma.

bonnieri Mont., 1893, 40, t. h. Trigla gurnardus; Wimereux.—1893: Dist. 1899: Liopyge (type). [1902: Liocerca (type).]

borcalis Sons., 1890, 177, misprint for borealis (Onchocotyle).

borealis Olss., 1893, 7, t. h. Thymallus vulgaris, Coregonus lavaretus; Scandinavia.—1893: Dactylodiscus (type). 1905: Tetraonchus.

borealis Ben., 1853l, 59, t. h. Scimnus glacialis.—1853: Onchocotyle. 1857: Polyst. 1899: Squalonchocotyle (type).

boschadis Schrank, 1790, 122.—1790: Festuc.

boschadis Schrank, 1803, 209, t. h. Anas boschas sylvestris, A. b. dom.—1803: Fasc.

bosci Cobbold, 1859d, 364, includes Fasc. colubri Bosc, Dist. colubri americani Rud., t. h. Coluber sp.—1859: Dist. 1895: D. (Dicrocœlium). [1905: Zeugorchis.]

boscii Cobbold, 1879, 455, for bosci.—1879: Dist. 1895: D. (Dicrocœlium).

bothriophoron Braun, 1892f, 49, t. h. Bos indicus; Madagascar.—1892: Amphist. 1901: Parmaphist.

bothriophorum Stiles, 1898a, 24, for bothriophoron (Amphist.).

bothryophoron Braun, 1892a, 700, for botryophoron (Dist.).

bothryophorus Olss., of Looss, 1899b, 728, renamed confusus 1905.—1899: Hemiurus. 1901: Lecithaster (type).

botryophoron Olss., 1868, 42, t. h. Cyclopterus.—1868: Dist. 1886: D. (Brachylaimus). 1905: Lecithophyllum (type).

botryophorum Odhn., 1905, 359, for botryophoron Olss., 1868.—1905: Lecithophyllum (type).

botryophorus Odhn., 1905, 357, for bothryophorus of Looss, 1899 (Hemiurus).—1905: Lecithaster. [L. confusus.]

boum Gmelin, 1790a, 354.—1790: Fasc. hepatica.

bovis Sons., 1876, 84, t. h. Bos taurus; Egypt.—1876: Bilharzia. 1893: Gynæcophorus. 1895: Schistosoma.

brachycœlia Luche, 1901d, 51, t. h. Box salpa; Genua.—1901: Mesometra.

brachycœlium Cohn, 1903, 39, host not given.—1903: Amphist.

brachydelphium Heymann, 1905, 81, t. h. Dermatemys mavii.—1905: Patagium (type).

brachysoma Villot, 1878, 27, t. h. Anthura gracilis Leach.—1878: Cerc. [1888: Dist. brachysoma.]

brachysomum Crep., 1837a, 314, t. h. Hæmatopus ostralegus.—1837: Dist. 1892: D. (Brachycœlium). 1899: Levinsenia (type). 1901: Levinseniella (type).

brachyura Fil., 1837a, 337, t. h. Planorbis submarginatus; Pavia. See next entry.—1837: Cerc.

brachyura Dies., 1850a, 296, Dist. polymorphum Fil., 1837a, 337, renamed; t. h. Planorbis submarginatus; Ticini.—1850: Cerc. 1855: Cerc. (Eucerc.). 1858: C. (Acanthocephala).

brachyura Lespés, 1857b, 117, t. h. Trochus cynereus.—1857: Cerc. [1858: C. (Acanthocephala) pachycerca.]

brachyurum Linst., 1905, 418, 422, misprint for baryurum (Monocœcum).

bramæ Mueller, 1776, 224, t. h. Cyprinus brama.—1776: Fasc. 1803: Dist. [1809: Dist. globiporum.] [Sphærost.]

bramæ Par. & Perugia, 1896, 1, t. h. Brama rayi; Genova.—1896: Octobothrium. 1898: Octocotyle.

branchialis Vallot, 1840.—1840: Astacobdella (type).

branchialis Darr, 1902, 644, t. h. mackerel; German East Africa.—1902: Bathycotyle (type).

braunii Cobbold, 1860a, 43, M. murænulæ renamed, t. h. Coregonus murænula.—1860: Monost.

brasilianum Stoss., 1902b, 15, t. h. Scolopax flaviceps; Brazil.—1902: Cyclocœlum.

brevicaudata Piana, 1882, teste Parona, 1894, 161, t. h. Helix carthusiana; Reggio Em.—1882: Cerc.

brevicaudatum Nord., 1832a, 52, t. h. Barbus communis; Berlin.—1832: Holost. 1850: Diplost.

brevicolle Crep., 1829, 54, t. h. Hæmatopus ostralegus; Greifswald.—1829: Dist. 1892: D. (Dicrocœlium). 1902: Psilost.

brevicornis Mont., 1889, 1, t. h. Hydromedusa maximiliani, Hydraspis radiolata; Brazil.—1889: Temnocephala.

breviplexus Staff., 1902, 901, t. h. Rana catesbiana, R. virescens; Canada.—1902: Hæmatolœchus. 1905: Pneumonœces.

brunnea Mueller, 1774, 54.—1774: Fasc. 1776: Planaria.

brunnea Dies., 1850a, 296, Cerc. III Baer, renamed; t. h. Limnæus stagnalis; Regiomontii.—1850: Cerc. 1855: C. (Eucerc.). 1858: C. (Gymnocephala.) [1858: Dist. echinata.]

brunnea var. Dies., see Erc., 1881e, 12.—[1881: Cerc. alba.]

brusinæ Stoss., 1889, 25, t. h. Oblata melanura; Triest.—1889: Dist. 1899: Pleurogenes. [1904: Diphterostomum (type).]

brusinai Looss, 1901, 399, for brusinæ 1889.—1901: Dist. 1903: D. (Brachycæcum). [1904: Diphterost. (type).]

buccatus Nicoll, 1907, 72, t. h. Hippoglossus vulgaris; Scotland.—1907: Stephanochasmus.

buccini Fil., 1855b, 23.—1855: Dist.

buccini mutabilis Fil., 1855b, 17, t. h. Buccinum mutabilis; Gulf of Genoa.—1855: Dist. 1855: Cerc. 1858: C. (Acanthocephala).

bucephalus Erc., 1881e, 40, t. h. Unio pictorum.—1881: Cerc.

buchholzii Braun, 1889a, 320, lapsus for "Fasc. hepatica, ovata plana, Buchholzii," see lanceatum.—1889: Fasc.

bufonis Linst., 1877, 185, t. h. Bufo vulgaris.—1877: Dist.

bulbosum Brand., 1888a, 67, t. h. Geronticus albicollis, Nauclerus furcatus; Mus. Vien.—1888: Holost.

bumpusii Lint., 1900a, 267, t. h. Dasyatis centrura; Woods Hole, Mass.—1900: Epibdella. 1903: Phylline.

bursæ fabricius Podwyssozki, 1890, 157, t. h. Gallus domesticus.—1890: Dist.

bursarium Nitzsch, in Giebel, 1857, 265, t. h. Falco peregrinus.—1857: Holost.

bursicola Crep., 1837, 310, t. h. Ardea cinerea.—1837: Dist. [Echinost. cloacinum.]

bursicola Odhn., 1900, 14, t. h. Somateria mollissima; Sweden.—1900: Gymnophallus.

bursicola Looss, 1899b, 694, t. h. Milvus parasiticus, Falco tinnunculus; Africa. See also africanum 1901.—1899: Echinost.

bursigerum Brand., 1888, 65, t. h. Larus ridibundus; Mus. Vien.—1888: Holost.

buski Bl., 1888a, 622, for buskii q. v.—1888: Dist. 1888: Dicrocœlium. 1893: D. (Dicrocœlium). 1895: Dist. 1895: Opisthorchis. 1902: Fasciolopsis.

buskii Lankester, 1857, 437, t. h. Homo; Asia.—1857: Dist. 1858: Dicrocœlium. 1895: Opisthorchis. 1901: Fasciolopsis [type].

buteonis Gmelin, 1790a, 3054, t. h. Falco buteo; Europe.—1790: Fasc. [1782: Plan.]. 1803: Dist.

cacozelus Nicoll, 1907, 72, t. h. Pleuronectes limanda, Hippoglossus vulgaris.—1907: Derogenes.

caduceus Odhn., 1902, 26, t. h. Krokodil; Sudan.—1902: Oistosomum (type).

caducus Looss, 1901e, 603, t. h. Gadus minutus, Lophius piscatorius; apparently Triest.—1901: Stephanochasmus.

cæca Haswell, 1900b, 432, t. h. Phreatoicopsis n. sp.; Victoria.—1900: Temnocephala.

[*cæruleum* Sluiter, 1898, 4, a tunicate (Dist.).]

cahirinum Looss, 1896, 119, t. h. Bagrus bayad; Cairo, Egypt.—1896: Dist. 1899: Haplorchis.

calceolus Mol., 1858, 129, t. h. Conger conger; Patavii.—1858: Dist. 1886: D. (Dicrocœlium).

calceostoma Wagener, 1857, 99, t. h. Sciæna aquila.—1857: Dactylogyrus. [1858: Calceost. elegans, type.] 1907: Calceost. type.

calicophorum Fischder., 1901, 370, t. h. Bos taurus; East Africa, Capland, Queensland, China.—1901: Paramphist.

calidris Rud., 1819a, 120, t. h. Scolopax calidris.—1819: Dist. [1850: Monost. mutabile.] [1886: D. brachysomum.]

caligarum Tasch., 1878, 564, for caligorum (Udonella).

caligi Kroyer, ———. ——: Phylline. 1858: Udonella. [1858: Udonella caligarum.]

caligi Ben., 1858a, 189, for caligorum.

caligorum Johnston, 1835, 497, t. h. Caligus on Hippoglossus vulgaris.—1835: Udonella (type).

calliomymi Ben., 1870, 53, t. h. Callionymus dracunculus.—1870: Dist.

calyptrocotyle Mont., 1891, 110, t. h. Beroë ovata.—1891: Dist. 1893: D. (Accacœlium.) [1900: Accacœlium.] 1902: Orophocotyle.

campannlatum Rivolta, 1884, 27, for campanulatum (Dist.).

campanula Duj., 1845a, 435, t. h. Esox lucius; Rennes.—1845: Dist. (Crossodera). [1850: D. nodulosum.] 1860: Crossodera. [1858: Gasterost. fimbriatum.] 1886: D. (Echinost.).

campanula Linst., 1886a, 125, for campula Cobbold.—1886: Dist. [1892: D. oblongum.]

campanulatum Erc., 1874, 432, t. h. Canis familiaris.—1874: Dist.

campula Cobbold, 1876, 40, oblonga (Campula) renamed.—1876: Dist. 1899: Metorchis. 1899: Opisthorchis.

canaliculatum Rud., 1819a, 676, t. h. Sterna sp., galericulata teste Dies.; Brazil.—1819: Dist. 1902: Bilharziella.

canaliculatum Mehlis in Crep., 1846, 138, t. h. Colymbus cristatus.—1846: Dist.

cancri locustæ Rud., 1810a, 288.—1878: Trematodum.

candida Mueller (or Abildg.), 1806a, v. 4, 32.—1806: Strigea. [1850: Holost. erraticum.]

candida Mueller, 1774, 71, in littore Grœnlandiæ sub lapidibus.—1774: Fasc. 1776: Planaria. ——: Tetrastemma.

canicula Cerf., 1899a, 374, Onchocotyle appendiculata Kuhn of Stoss., 1877, renamed; t. h. Scyllium canicula.—1899: Acanthonchocotyle.

canis Cerf., 1899a, 375, t. h. Galeus canis; Roscoff.—1899: Squalonchocotyle. 1900: Onchocotyle.

canthari Ben. & Hesse, 1863, 113; 1864, 113, t. h. Cantharus griseus.—1863: Microcotyle.

caouanæ Koll. in Braun, 1901b, 23, t. h. Thalassochelys caouana, int.—1901: Monost. [1901: Enodiotrema megachondrum.]

capense Looss, 1902m, 855, "Anaporrhutum ricchiardii Lopez" of Ofenh., renamed.—1902: Probolitrema.

capense Harley, 1864a, 55, t. h. Homo; Cape of Good Hope.—1864: Dist. 1864: Bilharzia.

capitala Bosc, 1802a, v. 1, 261; Baltic Sea.—1802: Planaria.

capitata Mueller, 1774, 70.—1774: Fasc. 1776: Planaria.

capitellatum Rud., 1819a, 83, 343, t. h. Sparus salpa; Naples.—1819: Monost. (Monost.).

capitellatum Rud., 1819a, 99, t. h. Uranoscopus scaber; Arimini and Naples.—1819: Dist. 1900: Anisocœlium (type).

capriciosa Cuénot, 1892, in l. 23, t. h. Synapta inhærens teste Braun, 1893b, 183.—1893: Cerc.

capsulare Dies., 1858e, 355, based on Wedl, 1857, v. 26, 247, pl. 1, fig. 8, t. h. Ardea purpurea, A. nycticorax, A. cinerea, Gallinula crex, Podiceps nigricollis.—1858: Dist. 1892: Agamodist.

capsularia Sons., 1892, 7 Oct., 144, t. h. Cleopatra bulimoides; Cairo, Egypt.—1892: Cerc.

capyristes Klein, 1905, 60, t. h. Rana hexadactyla.—1905: Pneumonœces.

carbonarii Cerf., 1895h, 929.—1895: Dactylocotyle.

carinariæ delle Chiaje, (1841a), 139.—1841: Dist.

carinatum Zed., 1803a, 217, cyprinaceum Zed., 1800, renamed.—1803: Dist. [1809: D. globiporum, pars D. inflexum.]

carnea Rathke, 1799, 83.—1799: Planaria.

carnosa Hass., 1891a, 208, in Bos taurus; U. S. A.—1891: Fasc. 1892: Dist. 1892: D. (Fasc.). [See americanum.]

carnosum Rud., 1819a, 93, t. h. Sparus dentex; Naples.—1819: Dist. 1886: D. (Brachylaimus).

carolinæ Stoss., 1889, 26, t. h. Alausa finta; Triest.—1889: Dist. [1891: Apoblema ocreatum.] 1899: Pronopyge. [1899: Pronopyge ocreata, type.]

caryocatactis Zed., 1800a, 163, t. h. Corvus caryocatactes; Europe.—1800: Dist. [1850: D. caudale.] [1902: Harmost. caudale.]

caryophyllacea Rud., 1810a, 353 for caryophyllina (Festucaria).

caryophyllata Bory de St. Vincent, 1823a, 354, in infusions de chènevis.—1823: Cerc.

caryophyllina Rud., 1802, 66, t. h. Gasterosteus aculeatus; Greifswald.—1802: Festuc. 1803: Monost. 1809: M. (Hypost.). 1828: Hypost. (probably type). 1845: Monost.

caryophyllum Dies., 1850a, 317, t. h. Falco pileatus; Rio Parana, Brazil.—1850: Eustemma (type). [1888: Holost. eustemma.]

caryophyllum Mont., 1892, 717, for caryophyllinum (Monost.).

catellina Mueller, 1786, 130, in aqua fossarum, ubi Lemna.—1786: Cerc. 1815: Furcocerca. 1827: Dicranophorus.

catellus Mueller, 1773, 65, in aqua [etc., see p. 124.].—1773: Cerc. 1815: Furcocerca. 1827: Dicranophorus.

caterrarium Looss, 1896, 118, t. h. Alosa finta; Cairo, Egypt.—1896: Dist.

cattoi R. Bl., in Catto, 1905, 70; 1905, 11, t. h. Homo; China.—1905: Schistosoma. [S. japonicum.]

caudale Rud., 1809a, 382, caryocatactis Zed., 1800, renamed, t. h. Corvus caryocatactes.—1809: Dist. 1901: Harmost.

caudale from Pyrrhocorax alpinus.—1809: Dist. [1902: Harmost. mesostomum.]

caudale of Mueller, 1897, 16, in Coracias garrula.—1897: Dist. [1902: Urogonimus macrostomus.]

caudata Goto, 1894, 186, t. h. Sebastes sp.; Japan.—1894: Microcotyle.

caudata Bosc, 1802a, 271, t. h. dorade.—1802: Fasc. [1809: Dist. coryphænæ.] [1819, 1850: D. tornatum.] 1859: Dist.

caudata Mueller, 1774, 70.—1774: Fasc. 1787: Planaria.

caudatum Polonio (1859), t. h. Natrix torquata, Tropidonotus viperinus; Padua.—1859: Dist. 1896: D. (Opisthorchis).

caudatum Linst., 1873, 103, t. h. Erinaceus europæus.—1873: Dist. 1892: D. (Brachylaimus.) 1899: Heterolope. [1899: D. leptostomum.]

caudiporum Rud., 1819a, 96, t. h. Zeus faber; Arimini.—1819: Dist. 1845: D. (Apoblema). 1901: Lecithochirium. 1907: Synaptobothrium.

caratica Fries.—Planaria.

cariæ Bosc, 1811, 269.—1811: Tetragulus. 1829: Linguatula.

cariæ Sons., 1890, 100, t. h. Cavia cobaya.—1890: Dist. 1893: Fasc. hepatica.

cellulosa Looss, 1896b, 227, t. h. Melania tuberculata Bourg.; near Alexandria, Egypt.—1896: Cerc.

centra appendiculatum Leidy, 1904a, 277, misprint for centrappendiculatum (Dist.).

centrappendiculatum Leidy, 1891a, 416, appendiculatum Leidy, 1877, 202 [not Rud.] renamed.—1891: Dist.

centrodes Braun, 1901g, 941, t. h. Tinamus variegatus; Brazil.—1901: Harmost.

cephala Risso, 1826, 262, t. h. Tetraodon luna; Europe.—1826: Trist. [1898: T. molæ.]

cephalo Kroyer, 1852–53a, 745, for cephala (Trist.).

cercatum Ben., 1858a, 179 [possibly lapsus for ——? ——].—1858: Monost.

cercatum Mont., 1893, 40, host and loc. unknown.—1893: Urogonimus. 1893: Dist.

cercatus Mont., 1893, 162, see cercatum (Urogonimus).

cercopitheci Cobbold, 1861e, 119, t. h. Cercopithecus fuliginosus.—1861: Cerc.

cerebrale Yamagiwa, 1890, 457, t. h. Homo; see westermanii.—1890: Dist. [Paragonimus westermanii.]

cervi Schrank, 1790, 123.—1790: Fasc. [1790: Festucaria.] 1893: Strigea. 1898: Amphist. 1901: Paramphist. (type).

cervi Zed., (1790), 65, t. h. Hirsch.—1790: Festucaria. See cervi Schrank.

cervi Gmelin, 1790a, 3054.—1790: Fasc. hepatica.

cervi Cobbold, 1861e, 119, t. h. Cervus axis.—1861: Cerc.

cesti veneris Vogt, ——, 299, t. h. Cestum veneris.—Dist.

ce.ticillus Mol., 1858, 131, t. h. Lophius piscatorius; Patavii.—1858: Dist. 1886: D. (Echinost.). 1893: Echinost. 1899: Anoiktost. 1899: Stephanost. (type). [1901: Stephanochasmus, type.]

cestoides E. Ben., 1870, 17, t. h. Raja batis.—1870: Dist.

cglindraceum Looss, 1894a, 37, misprint for cylindraceum (Dist.).

characis Stoss., 1886, 26, t. h. Charax puntazzo; Triest.—1886: Dist. (Brachylaimus).

chefrenianum Looss, 1896, 73, t. h. Rhinopoma microphyllum; Ghizeh.—1896: Dist. 1899: Lecithodendrium.

chefresianum Looss, 1896, pl. 5, misprint for chefrenianum (Dist.).

cheloniæ atræ Braun, 1899e, 629, see pachyderma.—1899: Dist.

cheloniæ imbricatæ Dies., 1858e, 358, based on Bellingham, 1844, 340, t. h. Chelonia imbricata; Ireland.—1858: Amphist.

chelydræ Staff., 1900, 406, t. h. Chelydra serpentina.—1900: Dist. 1905: Auridist. (type).

chelydræ MacCallum, 1902, 632, t. h. Chelydra serpentina; Dunnville, Ontario.—1902: Heronimus (type).

chiajæ Tasch., 1879, 251, for chiajei (Solenocotyle).

chiajeæ Mont., 1888, 89, for chiajei (Solenocotyle).

chiajei Dies., 1850a, 420, Polyst. loliginis Chiaje, 1823, renamed; t. h. Loligo vulgaris; Naples.—1850: Solenocotyle (type).

chilensis Gay, 1836, see next entry.—1836: Branchiobdella. 1850: Astacobdella.

chilensis Moquin-Tandon, teste E. Bl., 1849, 51, t. h. cangregos; Chili.—Branchiobdella. 1849: Temnocephala.

chili Osborn, 1903, 315, t. h. Micropterus dolomieu; Chautauqua, N. Y.—1903: Cryptogonimus (type).

chilinsis Mont., 1899, 113, for chilensis (Temnocephala).

chilostomum Mehlis, 1831, 186, t. h. Vespertilio murinus et al.—1831: Dist. 1892: D. (Dicrocœlium). 1900: Lecithodendrium.

chilostomum Ben., 1873, 27.—1873: Dist. [1892: D. aristotelis.]

chimæræ Ariola, 1899a 8, t. h. Chimæra monstrosa; Genova, Italy.—1899: Agamodist.

chimæræ Kroyer, 1852–53a, 813, t. h. Chimæra monstrosa L.—1853: Crobylophorus (type).

chinense Cobbold, 1876, 97, D. sinense renamed, t. h. Homo.—1876: Dist.

chiri Goto, 1894, 193, t. h. Chirus hexagrammus; Japan.—1894: Microcotyle.

chloropodis Zed., 1800a, xvii, 164, t. h. Fulica chloropus; Europe.—1800: Dist. [Dist. uncinatum.]

chlorotica Dies., 1850a, 296, Cerc. II Baer renamed; t. h. Paludina vivipara; Regio. montii.—1850: Cerc. 1855: C. (Eucerc.). 1858: C. (Acanthocephala).

choledochum Linst., 1883a, 306, t. h. Anas sp.—1883: Dist. 1892: D. (Dicrocœlium). 1898: Opisthorchis.

choledochus Odhn., 1900, 14, t. h. Vulpanser tadorna.—1900: Gymnophallus.

chordale Burckhardt, 1891a, 62, t. h. Protopterus annectens.—1891: Amphist. [1892: Tetracotyle, Holostomidæ.]

chryophrii Cerf., 1898a, 303, for chrysophryi (Choricotyle).

chrysophri St.-Remy, 1898, 555, for chrysophryi (Diclidophora).

chrysaëti Rud., 1819a, 119, t. h. Falco chrysaëtus.—1819: Dist. [1892: D. crassiusculum.]

chrysophris Mont., 1888, 11, 16, for chrysophryi (Choriocotyle).

chrysophryi Ben. & Hesse, 1863; 1864, 109, t. h. Chrysophrys aurata.—1864: Choricotyle (type). 1890: Octobothrium. 1890: Microcotyle. 1895: Diclidophora.

chrystallinum Hannover, 1864a, 3, for crystallinum 1819 (Dist.).

cignoides Mont., 1888, 40, 80, for cygnoides (Dist.).

ciliata Mueller, 1774, 55, free form.—1774: Fasc. 1776: Planaria.

cimbiforme Mont., 1896, 165 for cymbiforme (Dist.).

cincta Rud., 1803, 31, t. h. Tringa vanellus.—1803: Fasc. 1809: Dist. 1809: D. (Echinost.). 1860: Echinost.

cinctum Brand., 1888a, 67, t. h. Ardea sp.; Brazil.—1888: Holost.

[*cinerea* (anatomical term) Fasc.]

circularis Linst., 1904, 493; or 1894, 17, t. h. Acipenser ruthenus.—1904: Erpocotyle.

[*circumvallata* Sluiter, 1900. Dist. (tunicate).]

cirrata Rud., 1802, 66, of Rud., 1808, xxv, for F. cirrhata.—1802: Fasc. [cirrhata]. 1809: Dist. 1845: D. (Brachylaimus). 1899: Lepoderma. 1899: Plagiorchis.

cirrhata Rud., 1802, 66, t. h. Corvus frugilegus; Greifswald, June—1802: Fasc. 1855: Dist. 1899: Lepoderma.

cirrhigerum Nord., 1840, 616, for cirrigerum (Dist.).

cirrigerum Baer, 1827, 553, t. h. Astacus fluviatilis.—1827: Dist. [1850: D. isostomum.]

cirrosum Rud., 1808a, 296, for cirratum (Dist.).

cladocalium Dies., 1858, 354, t. h. Ardea minuta; based on Pontallié, 1853, 103.—1858: Dist.

clathratum Deslongchamps, in Lamouroux, 1824, 563, t. h. Cypselus apus.—1824: Dist. 1845: D. (Dicrocœlium). 1899: Dicrocœlium. [1899: Lyperosomum.]

clathratum Deslongchamps, of Olsson, 1876, 24, renamed olssoni 1900.—1876: Dist. [1900: Dicrocœlium olssoni.]

clathratum Dies., 1850a, 308, t. h. Lutra brasiliensis; Matogrosso.—1850: Hemist.

clausi Mont., 1888, 79 for clausii (Cerc.).

clausii Mont., 1888, 72.—1888: Cerc.

clava Dies., 1850a, 356, hosts Eunectes scytale, Hydroscopus plumbeus, Coluber flaviventris, Clœlia fasciata; Brazil.—1850: Dist. 1899: Telorchis (type).

clavata Menzies, 1791, 187, t. h. Scomber pelamys; Pacific.—1791: Fasc. 1808: Dist. 1828: Hirudinella (type).

clavatum Steenstrup, 1842, 59, under skin of frogs, Rana temporaria, [for 1842: Amphist. subclavatum?].

clavatum Nord., 1832, 42, t. h. Perca cernua, P. fluviatilis, P. lucioperca.—1832: Diplost. 1850: Tylodelphys (type).

claviforme Brand., 1888, 247, t. h. Tringa alpina.—1888: Dist. 1899: Lecithodendrium. 1892: D. (Brachycœlium). 1907: Spelotrema.

clavigerum Zed., 1803a, 199, Festuc. strigis 1788, renamed; in Strix.—1803: Amphist. [1809: A. macrocephalum.]

clavigerum Rud., 1819a, 103, t. h. Bufo viridis, at Berlin; B. cinereus, Rana temporaria, R. esculenta, Hyla arborea.—1819: Dist. 1845: D. (Brachycœlium). 1899: Pleurogenes (type).

calvigerum Rud. of Duj., 1845a, renamed confusus, 1894.—1845: Dist. (Brachycœlium). 1899: Prosotocus, type.

clavus Mol., 1858, 128, t. h. Gadus merlucius; Patavii.—1858: Holost.

cloacinum Braun, 1901, 259, bursicola Crep., renamed.—1901: Echinost.

clupeæ Ben., 1870, 67, t. h. Clupea sprattus; Belgium.—1870: Gasterost.

clupeæ Schrank, 1788, 20, t. h. rheinische Mayfische.—1788: Fasc. 1803: Dist.

clupeæ rhenanæ Rud., 1809a, 437, includes Fasc. alosæ Hermann, 1783, F. clupeæ Schrank, 1788.—1809: Dist.

cobboldi Fischder., 1901, 372, for cobboldii (Gastrothylax).

cobboldi Montgomery, 1906, Feb. 12, 21, t. h. Equus caballus; India.—1906: Pseudodiscus.

cobboldii J. Poir., 1883, 77, t. h. Palonia frontalis; Java.—1883: Gastrothylax.

cobitidis Linst., 1890d, 179, t. h. Cobitis barbatula.—1890: Diplost.

coccineum Cuv., 1817, 42, t. h. la môle, le xiphias, etc.—1817: Trist. (type). 1820: Phylline. 1828: Capsala.

coccineum of Rud., 1819a, 123, in Orthagoriscus molæ, Xiphias gladius, renamed rudolphianum, 1850.—1819: Trist.

cochlea Wedl, 1857, 258, t. h. Esox lucius.—1857: Gyrodactylus. [1888: Tetraonchus monenteron.] 1890: Dactylogyrus.

cervi Schrank, 1790, 123.—1790: Fasc. [1790: Festucaria.] 1893: Strigea. 1898: Amphist. 1901: Paramphist. (type).

cervi Zed., (1790), 65, t. h. Hirsch.—1790: Festucaria. See cervi Schrank.

cervi Gmelin, 1790a, 3054.—1790: Fasc. hepatica.

cervi Cobbold, 1861e, 119, t. h. Cervus axis.—1861: Cerc.

cesti veneris Vogt, ——, 299, t. h. Cestum veneris.—Dist.

ce.ticillus Mol., 1858, 131, t. h. Lophius piscatorius; Patavii.—1858: Dist. 1886: D. (Echinost.). 1893: Echinost. 1899: Anoiktost. 1899: Stephanost. (type). [1901: Stephanochasmus, type.]

cestoides E. Ben., 1870, 17, t. h. Raja batis.—1870: Dist.

cglindraceum Looss, 1894a, 37, misprint for cylindraceum (Dist.).

characis Stoss., 1886, 26, t. h. Charax puntazzo; Triest.—1886: Dist. (Brachylaimus).

chefrenianum Looss, 1896, 73, t. h. Rhinopoma microphyllum; Ghizeh.—1896: Dist. 1899: Lecithodendrium.

chefresianum Looss, 1896, pl. 5, misprint for chefrenianum (Dist.).

cheloniæ atræ Braun, 1899e, 629, see pachyderma.—1899: Dist.

cheloniæ imbricatæ Dies., 1858e, 358, based on Bellingham, 1844, 340, t. h. Chelonia imbricata; Ireland.—1858: Amphist.

chelydræ Staff., 1900, 406, t. h. Chelydra serpentina.—1900: Dist. 1905: Auridist. (type).

chelydræ MacCallum, 1902, 632, t. h. Chelydra serpentina; Dunnville, Ontario.—1902: Heronimus (type).

chiajæ Tasch., 1879, 251, for chiajei (Solenocotyle).

chiajeæ Mont., 1888, 89, for chiajei (Solenocotyle).

chiajei Dies., 1850a, 420, Polyst. loliginis Chiaje, 1823, renamed; t. h. Loligo vulgaris; Naples.—1850: Solenocotyle (type).

chilensis Gay, 1836, see next entry.—1836: Branchiobdella. 1850: Astacobdella.

chilensis Moquin-Tandon, teste E. Bl., 1849, 51, t. h. cangregos; Chili.—Branchiobdella. 1849: Temnocephala.

chili Osborn, 1903, 315, t. h. Micropterus dolomieu; Chautauqua, N. Y.—1903: Cryptogonimus (type).

chilinsis Mont., 1899, 113, for chilensis (Temnocephala).

chilostomum Mehlis, 1831, 186, t. h. Vespertilio murinus et al.—1831: Dist. 1892: D. (Dicrocœlium). 1900: Lecithodendrium.

chilostomum Ben., 1873, 27.—1873: Dist. [1892: D. aristotelis.]

chimæræ Ariola, 1899a 8, t. h. Chimæra monstrosa; Genova, Italy.—1899: Agamodist.

chimæræ Kroyer, 1852–53a, 813, t. h. Chimæra monstrosa L.—1853: Crobylophorus (type).

chinense Cobbold, 1876, 97, D. sinense renamed, t. h. Homo.—1876: Dist.

chiri Goto, 1894, 193, t. h. Chirus hexagrammus; Japan.—1894: Microcotyle.

chloropodis Zed., 1800a, xvii, 164, t. h. Fulica chloropus; Europe.—1800: Dist. [Dist. uncinatum.]

chlorotica Dies., 1850a, 296, Cerc. II Baer renamed; t. h. Paludina vivipara; Regio. montii.—1850: Cerc. 1855: C. (Eucerc.). 1858: C. (Acanthocephala).

choledochum Linst., 1883a, 306, t. h. Anas sp.—1883: Dist. 1892: D. (Dicrocœlium). 1898: Opisthorchis.

choledochus Odhn., 1900, 14, t. h. Vulpanser tadorna.—1900: Gymnophallus.

chordale Burckhardt, 1891a, 62, t. h. Protopterus annectens.—1891: Amphist. [1892: Tetracotyle, Holostomidæ.]

chryophrii Cerf., 1898a, 303, for chrysophryi (Choricotyle).

chrysophri St.-Remy, 1898, 555, for chrysophryi (Diclidophora).

chrysaëti Rud., 1819a, 119, t. h. Falco chrysaëtus.—1819: Dist. [1892: D. crassiusculum.]

chrysophris Mont., 1888, 11, 16, for chrysophryi (Choriocotyle).

chrysophryi Ben. & Hesse, 1863; 1864, 109, t. h. Chrysophrys aurata.—1864: Choricotyle (type). 1890: Octobothrium. 1890: Microcotyle. 1895: Diclidophora.

chrystallinum Hannover, 1864a, 3, for crystallinum 1819 (Dist.).

cignoides Mont., 1888, 40, 80, for cygnoides (Dist.).

compactus Fischder., 1901, 370, t. h. Bos taurus; Africa.—1901: Stephanopharynx (type).

compascua Kowal., 1898, 72, see xanthosoma compascua.—1898: Opisthorchis. 1902: Metorchis.

complanatum Rud., 1814a, 103, t. h. Ardea cinerea; Berlin, Germany.—1814: Dist. 1845: Dist. (Dicrocœlium). 1899: Clinost.

complanatum Erc. of Par., 1894, 144, for campanulatum (Dist.).

complexum Stiles & Hass., 1894e, 425, t. h. Felis catus dom.; U. S. A.—1894: Dist. (Dicrocœlium). 1896: Opisthorchis. 1899: Metorchis.

complexus Seely, 1906, 249, t. h. Rana pipiens; North Carolina, U. S. A.—1906: Pneumonœces.

complicatum Mehlis, 1846, 141, t. h. Haliaëtus carbo.—1846: Dist.

compressus Brand., 1898a, 27, t. h. Bos indicus; Vien. Mus.—1898: Gastrothylax.

concavum Crep., 1825a, 45, t. h. Colymbus rufogularis.—1825: Dist. 1892: D. (Dicrocœlium). 1899: Tocotrema. 1899: Cryptocotyle (type). 1899: Cotylogonimus (Cryptocotyle, type). 1903: Cryptocotyle.

conchicola Baer, 1826a, 124, t. h. Anadonta, Unio; Prussia.—1826: Aspidogaster (type). 1851: Aspidonotus (type).

conchicole Gronkowski, 1902a, 515, for conchicola (Aspidogaster).

conchiola Mont., 1888, 40, for conchicola (Aspidogaster).

conchycola Dies., 1850a, 414, for conchicola (Aspidogaster).

concinna Scott, 1904, 278, t. h. Trygon pastinaca; Scotland.—1904: Thaumatocotyle (type).

concinna Scott, 1902, 301; t. h. not given.—1902: Acanthocotyle.

concinnum Braun, 1901, 700, t. h. Viverra zibetha.—1901: Dicrocœlium.

confusum Looss, 1894a, 2, 101, D. clavigerum of Duj., 1845a, renamed; t. h. Rana esculenta; Paris, Rennes.—1894: Dist. 1899: Prosotocus (type). 1905: Pleurogenes.

confusus Odhn., 1905, 357, bothryophorus of Looss, 1899, 728, renamed; t. h. Alosa finta in Mediterranean and Clupea harengus in North Sea.—1905: Lecithaster (type by Odhn.).

coni mediterranei Fil., 1857c, 14, t. h. Conus mediterraneus; Mediterranean.—1857: Cerc. 1858: Cercariæum.

conicum Polonio, 1859, teste Par., 1894, 627.—1859: Dist.

conicum Polonio, 1859, t. h. Natrix torquata; Padua.—1859: Diplodiscus.

conicum Zed., 1803a, 188, Festucaria cervi Zed., 1790, renamed; t. h. Cervus elaphus.—1803: Monost. 1809: Amphist. [1901: Paramphist. cervi, type.]

coniferum Mehlis in Creplin, 1846, 138, t. h. Colymbus cristatus.—1846: Holost.

conis Perroncito, 1886, 250, misprint for conus Crep., 1825.—1886: Dist.

coniunctum Rivolta, 1884, 26, for conjunctum, 1860 (Dist.).

conjunctum Cobbold, 1860a, 8, t. h. American Canis fulvus.—1860: Dist. 1893: D. (Brachylaimus). 1895: Opisthorchis. 1899: Metorchis.

conjunctum of Lewis & Cunningham, as a parasite of man, in India, see noverca.—1872: Dist. 1895: Opisthorchis.

conoideus Bloch, 1782a, 35, t. h. Anas boschas dom.; Europe.—1782: Cuculanus. [1850: D. echinatum.] 1886: Dist. 1896: Echinost.

conostomum Olss., 1876, 17, t. h. Coregonus oxyrhynchus.—1876: Dist. 1886: D. (Brachylaimus). [1899: Spathidium.] 1902: Phyllodist.

constrictum Dies., 1850a, 322, t. h. Abramis brama.—1850: Monost. 1892: Diplostomulum.

constrictum Leared, 1862, 271, t. h. edible turtle; see mistroides.—1862: Dist. 1896: Mesogonimus. 1899: Hapalotrema (type).

constrictum Mehlis, 1846, 142, t. h. Anas mollissima, A. nigra.—1846: Dist.

constructum Staff., 1900, 407, misprint for constrictum Leared (Dist.).

continuum Ariola, 1899, 6, t. h. Carcharias rondeletti; Genova.—1899: Dist.

contortum Rud., 1819a, 118, t. h. Orthagoriscus mola; Naples.—1819: D. (Echinost.) 1893. D. (Accacœlium). 1898: Podocotyle. 1899: Accacœlium (type).

contractus Looss, 1902, 136, t. h. Mugil chelo.—1902: Dicrogaster.

contribulans Braun, 1901f, 568, t. h. Hirundo rustica.—1901: Eumegacetes.

conum Erc., 1881a, or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata; Bologna.—1881 or 82: Cerc.

conum Huber, 1896a, 578, for conus Crepl. (Dist.).

conus of Gurlt, 1831, 193.—1831: Dist. [1903: Opisthorchis felineus.]

conus Crep., 1825, 50, t. h. Felis catus dom., Canis vulpes.—1825: Dist. 1892: D. (Dicrocœlium). 1896: Opisthorchis.

convera Luehe 1901, 474, t. h. Conger conger; Coll. Berlin.—1901: Lecithochirium.

convolutum Brand. MS., in Braun, 1901f, 565, t. h. Platalea ajaja.—1901: Dist. [1902: Mesaulus grandis.]

copulans Cohn, 1902, 877, t. h. Cryptobranchus japonicus.—1902: Liolope (type).

copulans Linst., 1904, 254, t. h. Arnoglossus laterna; ? Louvain.—1904: Synaptobothrium (type). 1906: Lecithochirium.

cordatum Dies., 1850a, 308, t. h. Felis cat. fer.; M. C. V.—1850: Hemist.

cordiforme Braun, 1900f, 389, or 1900b, 225, t. h. Molossus sp.; Brazil.—1900: Lecithodendrium.

cordiformis Wolf, 1903, 602, t. h. Squalus sp.—1903: Braunina.

coregoni feræ Chauvannes, —, 62; see Dies., 1858d, 283.—1858: Cercariæum.

cornifrons Leidy, 1878, 382, t. h. Donax fossor.—1878: Dist.

cornu Dies., 1839a, 235, t. h. Doras sp.=Cataphractus vacu; Forte do Rio Branco; Brazil. -1839: Amphist. [1860: A. nattereri.]

cornu Nitzsch, in Rud., 1819a, 89, t. h. Ardea cinerea, A. garzetta; Europe.—1819: Amphist. 1819 [p. 357]: Holost.

cornu Linst., 1878, 228, t. h. Abramis vimba; middle Europe.—1878: Dactylogyrus.

cornu Zed., 1800a, xvii, t. h. Ardea cinerea; Europe.—1800: Dist. 1809: Amphist. 1819: Monost. (Monost.)

cornucopia Mol., 1859, 287, t. h. Strix flammea ?; Batavia.—1859: Holost.

cornuta Bosc, 1802a, v. 3, 244.—1802: Cerc.

cornuta Osborn, 1903, 63, t. h. crawfish, black bass, and catfish; Lake Chautauqua, N. Y.—1903: Bunodera. 1904: Crepidost.

cornutum Rud., 1808a, xxv; 1809a, 343; t. h. Charadrius pluvialis; Greifswald, Europe.—1808: Amphist. 1845: Holost.

cornutum Verrill, 1875, 40, t. h. Tetrapterus albidus; North America.—1875: Trist.

coronarium Cobbold, 1861e, 119, t. h. Alligator mississippiensis.—1861: Dist. 1899: Anoiktost. 1896: D. (Echinost.). 1899: Acanthost. 1901: Acanthochasmus.

coronata Fil., 1855b, 10, t. h. Lymnæus palustris, L. stagnalis; Moncalier.—1855: Cerc. 1858: C. (Gymnocephala).

coronatum Leidy, 1888, 127, t. h. terrapin; eastern U. S. A.—1888: Polyst.

coronatum Rud., 1819a, 686, t. h. Didelphis?) virginiana; Brazil.—1819: Dist. (Echinost.). 1850: Rhopalophorus (type). 1892: Echinost. 1898: Rhopalias (type).

coronatum Rentsch, 1860, 38, t. h. Gasterosteus spinachia.—1860: Dist.

coronatum Wagener, 1852, 567, t. h. Corvina nigra; Nice.—1852: Dist. 1886: D. (Echinost.). 1898: Echinost. 1899. Anoiktost. (type).

corone Dies., 1858e, 322, t. h. Corvus corone; Ireland.—1858: Holost.

corpulentum Lint., 1905, 327, t. h. Lagodon rhomboides, Orthopristis chrysopterus; Beaufort, N. C. -1905: Dist.

corrigia Braun, 1901, 946, t. h. Tetrao tetrix; Coll. Vien.—1901: Lyperosomum.

corrugatum Duj., 1845a, 409, t. h. Sorex tetragonurus; Rennes.—1845: Dist. (Brachylaimus).

corvina Stoss., 1886, 46, t. h. Corvina nigra; Triest.—1886: Dist. 1886: D. (Echinost.). [1899: Anoiktost. (type).]

corvinum Stiles & Hass., 1894, 418, t. h. Corvus americanus, C. ossifragus; U. S. A.—1894: Dist. longissimum. 1898: Opisthorchis.

coryphænæ Bosc, 1802, 271, t. h. "dorade".—1802: Fasc. 1809: Dist. [1850: D. clavatum: D. tornatum.]

coryphæna hippuridis Tilesius in Litt. Rud., 1809a, 436.—1809: Fasc. [1809: Dist. coryphænæ.]

coryphenæ Cobbold, 1879b, 460, for coryphænæ (Dist.).

coryphœnæ Cobbold, 1879b, 461, for coryphænæ (Dist.).

[*costæ* D. Valle (Dist.), a tunicate.]

cotti Linst., 1889a, 80 based on Zschokke, 1884, 204, t. h. Cottus gobio; Lake Leman.—1884: Monost.

cotylophorum Fischder, 1901a, 370, t. h. Bos taurus at Togo, B. zebu in German East Africa.—1901: Paramphist.

cotylura Pag., 1862, 293, t. h. Trochus cinereus; Cette.—1862: Cerc.

craniaria Dies., 1858, 316, t. h. Cobitis fossilis.—1858: Tylodelphys. 1860: Diplost.

cranum Huber, 1896a, 575, misprint for crassum (Dist.).

crassa Rud., 1793a, 27, F. melis Gmelin renamed.—1793: Fasc.

crassa Sons., 1888, 124.—1888: Bilharzia. 1892: Gynæcophorus. 1899: Schistosoma.

crassa Erc., 1881 or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata; Bologna.—1881: Cerc.

crassicauda Erc., 1881 or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata; Bologna.—1881: Cerc.

crassicaudatum Busch, 1851, 99, t. h. Sagitta.—1851: Dist.

crassicaudatum Leuck. in Kollar, 1836, 81, t. h. Acipenser stellatus.—1836: Diklibothrium. 1839: Diclibothrium. [1840: Hexacotyle elegans.] [1850: D. armatum.]

crassicolle Rud., 1809a, 378, for Fasc. salamandræ; t. h. Salamandra atra.—1809: Dist. 1845: Dist. (Brachycœlium). [1896: Brachycæcum, type.] 1899: Brachycœlium (type). 1899: Dist. (Dicrocœlium). 1899: Lecithodendrium.

crassiusculum Rud., 1809a, 408, Planaria bilis Braun, renamed; t. h. Falco melanaëtus.—1809: Dist. 1892: D. (Brachylaimus). 1898: Opisthorchis. 1899: Metorchis.

crassiuscula var. *janus* Kowal., 1898h, 122, t. h. Anas boschas dom.—1898: Opisthorchis. 1898: Campula. [1899: Metorchis.]

crassiusculus Wedl, 1857, 258, t. h. Lucioperca sandra.—1857: Gyrodactylus. [1858: Tetraonchus unguiculatus.] 1890: Dactylogyrus.

crassum Cobbold, 1860a, 5, buskii renamed, t. h. Homo.—1860: Dist. 1899: Fasciolopsis.

crassum Olss., 1876, 25, t. h. Hirundo urbica.—1876: Dist.

crassum Sieb., 1836, 234, t. h. Hirundo urbica.—1836: Dist. 1892: D. (Dicrocœlium). 1907: Eumegacetes.

crassus Looss, 1901l, 568, t. h. Thalassochelys corticata; Egypt.—1901: Glyphicephalus. 1902: Epibathra (type).

crenata Rud., 1802, 76, t. h. Gasterosteus aculeatus, Pleuronectes maximus.—1802: Fasc. 1809: Dist. 1889: Apoblema. 1901: Hemiurus. 1905: Brachyphallus (type).

crenata Frœlich, 1802a, 60, t. h. Fulica chloropus; Europe.—1802: Fasc. [1814: Dist. uncinatum.]

crenata Mueller, 1774, 64.—1774: Fasc. 1776: Planaria.

crenatum Mol., 1859, 840, t. h. Centrolophus pompilius; Batavii.—1859: Dist. 1886: D. (Apoblema). 1889: Apoblema. 1899: Hemiurus. [1901: Lecithocladium excisum.] 1905: Brachyphallus.

crenulatum Rud., 1809a, 328, t. h. Motacilla phœnicurus; Greifswald.—1809: Monost. (Monost.).

crenulatum Cobbold, 1860a, 47, t. h. Anas nigra; Ireland.—1860: Holost.

cristallina Sons., 1893, 188, for crystallina Rud., 1819 (Tetracotyle).

[*cristallinum* Ren. (Dist.), tunicate.]

cristata La Valette, 1855, 23, t. h. Lymnæus stagnalis.—1855: Cerc. [1858: Lophocercaria fissicauda.]

cristatum Rud., 1819a, 117, t. h. Stromateus fiatola; Arimini.—1819: Dist. (Echinost.). 1860: Echinost.

croaticum Stoss., 1889, 183, t. h. Carbo graculus; Fiume, Croazia.—1889: Dist. 1892: Echinost.

crocodili Poir., 1886, 30, t. h. Crocodilus siamensis.—1886: Dist. 1895: Echinost.

crotali "Humboldt."—Dist., an arachnoid [now in Porocephalus].

crotali durissi Rud., 1809a, 433, for crotali.—1809: Dist. [1819: Pentast. proboscideum.]

cruciatus Wedl, 1857, 258, t. h. Cobitis fossilis.—1857: Gyrodactylus. 1858: Tetraonchus. 1890: Dactylogyrus.

crucibulum Rud., 1819a, 83, t. h. Muræna conger, M. cassini (M. myroides); Naples.—1819: Monost. (Monost.). 1845: Dist. (Crossodera). 1850: Monost. 1859: Gasterost. 1905: Prosorhynchus.

crucifer Wagener, 1857, 55, t. h. Cyprinus erythrophthalmus.—1857: Dactylogyrus.

crumena Mueller, 1786, 129, in infuso Ulvæ linzæ marino.—1786: Cerc. 1815: Furcocerca. 1827: Crumena, type.

crumenifer Otto, 1896, 94, see crumeniferum.—1896: Gastrothylax.

crumeniferum Crep., 1847, 30, t. h. Bos taurus indicus.—1847: Amphist. 1883: Gastrothylax (type).

crumigerum Fischder., 1903h, 563.—1903: Amphist. [1903: Gastrothylax compressus.]

crux Levin., 1881, 80, t. h. Modiolaria discors; Egedisminde.—1881: Bucephalus.

cryptobothrium Ben., 1870, 1871a, 31, t. h. Trigla gurnardus; Belgium.—1870: Dist.

crystallinum Rud., 1819a, 100, hosts Rana esculenta, R. temporaria, Bufo viridis, B. igneus, Vipera berus; Berlin.—1819: Dist. 1877: (ex parte) Tetracotyle.

cteniceps Leidy MS. in Stiles & Hass., 1894, 249, t. h. Fiber zibethicus.—1894: Dist.

ctenolabri Staff., 1905, 682, t. h. Ctenolabrus adspersus.—1905: Dermocystis (type).

cucullus Ziegler, 1883, 540, for cuculus (Bucephalus).

cuculus McCrady, 1874, Dec. 3, 176, t. h. Ostrea virginiana; Charleston, S. C.—1874: Bucephalus. [1874: Hydricuculus, type.]

cucumerina Erc., 1881, see Par., 1894, 364, t. h. Bythinia tentaculata; Bologna.—1881: Cerc.

cucumerina Rud., 1804, 166 in liver of Pleuronectes maximus.—1804: Fasc.

cucumerinum Rud., 1809a, 360, host Avis riparia, gen. sp. incert.—1809: Dist. 1889: Monost. 1902: Typhlocœlum.

cuneatum Rud., 1809a, 358, t. h. Otis tarda; Greifswald.—1809: Dist. 1901: Prosthogonimus.

cuspidatum Looss, 1896b, 96, t. h. Milvus parasiticus; Matarieh.—1896: Dist. 1899: Anoiktost. 1899: Centrocestus (type).

cuticola Nord., 1832, 49, t. h. Cyprinus, see p. 290.—1832: Holost. [1832: Cryptostomum.] 1850: Diplost. 1892: Tetracotyle. [1898: Hemist. denticulatum.] 1902: Tetracotyle.

cuticula Kroyer, 1852–53a, 1250, for cuticola (Holost.).

cycladis rivicolæ Dies., 1850a, 298, based on Sieb., 1837, 388, t. h. Cyclas rivicola.—1850: Cerc. 1855: Cercariæum.

cyclidium Mueller, 1773, 68, in Aquis purioribus frequens.—1773: Cerc. 1827: Cyclidium, type.

cyclophora Braun, 1896, 3, t. h. Notothenia sp.; Navarin, Puerto Toro.—1896: Lophocotyle (type).

cyclopteri Rud., 1809a, 438, t. h. Cyclopterus lumpus.—1809: Dist. [1850: D. reflexum.]

cygni oloris Dies., 1858e, 344, based on Bellingham, 1844, 427.—1858: Dist. [1858: D. echinatum.]

cygnoides Zed., 1800a, 163, t. h. Rana esculenta.—1800: Dist. 1845: D. (Dicrocœlium.) 1889: D. (Polyorchis). 1898: Pleorchis. 1899: Phyllodist. 1899: Gorgodera (type).

cygnoides Schrank, 1803, 212, t. h. ———.—1803: Fasc.

cygnoidis Sons., 1893, 187, for cygnoides (Dist.).

cylindraceum Zed., 1800a, 163, t. h. Rana esculenta.—1800: Dist. 1802: Fasc. 1845: Dist. (Dicrocœlium). 1847: Brachylæmus. 1899: Haplometra (type).

cylindraceum Zed., of Pachinger, 1888.—1888: Dist. [1894: D. variegatum.]

cylindrica Goeze, 1782a, 174, a "Klasse."—1782: Planaria. 1841: Dist.

cylindricum Dies., 1836d, 249, t. h. Cataphractus murica; Villa Maria, Brazil.—1836: Amphist.

cylindricum ranæ Mayer, 1841, 18.—1841: Dist.

cymbiforme Rud., 1819a, 96, t. h. Testudo mydas; Arimini.—1819: Dist. 1895: D. (Brachylaimus). 1899: Phyllodist. 1899: Spathidium. 1901: Plesiochorus (type).

cymbium Dies., 1850a, 320, t. h. Himantopus wilsonii; Caiçaræ, Brazil.—1850: Monost. [1819: M. flavum.] 1902: Hæmatotrephus.

cymbuliæ Græffe, 1860a, 47, t. h. Cymbulia peronii Les; Nizza.—1860: Cerc.

cymbuliæ delle Chiaje (1841a, 109).—Dist.

cyprinacea Schrank, 1790, 122, t. h. Cyprinus barbus.—1790: Festucaria.

cyprinaceum Zed., 1800a, 164, in intest. Cyprinorum.—1800: Dist. [1850: D. globiporum.]

cyprinæ Leach in Johnston, 1865, 35, t. h. Cyprina islandica; Plymouth, Eng.—1865: Monost. [1865: Malacobdella grossa.]

cyprini carassii Viborg, 1795, 242.—1795: Fasc.

cyprini idi (peritonei) Dies., 1858e, 367, t. h. Leuciscus idus; Rennes.—1858: Dist. [1858: ? Tetracotyle echinata.]

cyprini idi Moul., 1856, 233.—1856: Tetracotyle. [1858: T. typica.]

cysticola phalangii opilionis Dies., 1855, 64, see cystidicola 1846.—1855: Dist.

cysticum Crep., 1846a, 159, t. h. Planorbis sp.—1846: Dist.

cystidicola Crep., 1846, 156, t. h. Phalangium opilio.—1846: Dist.

cystophona Will.-Suhm, 1870, 5, for cystophora (Cerc.).

cystophora Wagener, 1866, 145, t. h. Planorbis marginatus.—1866: Cerc.

dactyliferum Braun, 1892a, 568, for dactylipherum (Dist.).

dactylipherum Poir., 1885, 10, t. h. Argonauta.—1885: Dist.

deflectens Rud., 1819a, 677, t. h. Sylvia sp., Motacilla sp.; Brazil.—1819: Dist. 1901: Dicrocœlium.

delectans Braun, 1901g, 945, t. h. Myiothera ruficeps; Brazil.—1901: Dicrocœlium.

delicatulum Dies., 1850a, 325, includes Dist. testudinis Rud., 1819a, 121, t. h. Emys europæa, Halichelys atra; Mus. Vien.—1850: Monost.

delicatulum Rud., 1809a, 373, t. h. Anas sponsa.—1809: Dist. 1828: Fasc.

deliciosum Olss., 1893, 10, t. h. Larus argentatus.—1893: Dist. 1900: Gymnophallus (type).

delitescens Looss, 1899b, 666, t. h. Chelonia mydas; apparently Egypt.—1899: Cricocephalus (type). [See also albus.]

delphini Dies., 1850a, 330, t. h. Delphinus dalei; near Havre.—1850: Monost. [1860: M. blainvillei.] 1892: Monostomulum.

delphini Poir., 1886, 34, t. h. Delphinus delphis.—1886: Dist. 1892: Cladocœlium. 1899: Brachycladium.

dendricum Ben., 1870, 36, for dendriticum (Dist.).

dendriticum Rud., 1819a, 93, t. h. Xiphias gladius.—1819: Dist. 1896: D. (Dicrocœlium). 1899: Dicrocœlium.

dendyi Haswell, 1893e, 96, t. h. Astacopsis bicarinatus; Australia.—1893: Temnocephala.

dentatum Lint., 1900: 269, t. h. Paralichthys dentatus.—1900: Dist.

denticulata Rud., 1802, 91, t. h. Sterna hirundo; Greifswald, July.—1802: Fasc. 1809: Dist. (Echinost.). 1860: Echinost.

denticulata Rud., 1805, an arachnoid.—1808: Polyst. 1809: Polyst. (Pentast.), [now in Linguatula].

denticulatum Rud., 1819a, 90, t. h. Alcedo ispida; Mus. Vien., Europe.—1819: Amphist. 1845: Holost. 1850: Hemist.

denticulatum Olss., 1876, 10, t. h. Gadus virens.—1876: Octobothrium. 1895: Dactylocotyle.

depressum Polonio, 1859, teste Par., 1894, 149, t. h. Triton cristatus; Padua.—1859: Dist.

depressum Stoss., 1883, 118, t. h. Dentex vulgaris; Triest.—1883: Dist. 1886: D. (Brachylaimus).

detruncatum Braun, 1899g, 490, t. h. Mycteria americana, Ciconia americana; Brazil.—1899: Clinost. 1900: Dist.

diadema Mont., 1902, 137, t. h. Trygon violacea.—1902: Epibdella. 1903: Phylline. 1902: E. (Phylline).

diaphanum Odhn., 1902, 154, t. h. Polypterus bichir; White Nile.—1902: Callodist. (type).

diaphanum Staff., 1904, 494, t. h. Ambloplites rupestris; Canada.—1904: Protenteron (type).

diaphanum Cerf., 1894k, 936, t. h. Raja batis.—1894: Merizocotyle (type).

dichotoma Mueller, in LaValette, 1855, 38, free form.—1855: Cerc. 1858: C. (Schizocerca).

dicorynum Dies., 1850a, (359), 680, t. h. Lampris guttatus; new name for D. affine Dies. 1850: Dist. 1886: D. (Köllikeria?).

dicranocolum Fischder., 1901a, 369, t. h. Bos taurus indicus; Coll. Berl. Vet. School.—1901: Paramphist.

dictyotus Mont., 1893, 156, reticulatum Looss, 1885, renamed.—1893: Dist. 1893: Mesogonimus (type).

didelphidis Par., 1896, 3, t. h. Didelphys azaræ; Paraguay.—1896: Dist. (Brachylaimus). 1904: Plagiorchis.

didelphydis Stoss., 1904, 2, for didelphidis Par.—1904: Dist. [D. (Brachylaimus).]

diesingi Braun, 1901, 561, for diesingii 1860.—1901: Dist. [1902: Microlistrum cochlear.]

diesingi Fil., 1837a, 334, t. h. Planorbis nitidus; Ticino.—1837: Diplodiscus. 1856: Cerc. [1850: Diplocotyle mutabile (type).]

diesingii Fil., 1854a, 6, for diesingi (Cerc.). 1854: Diplodiscus.

diesingii Cobbold, 1860a, 14 (D. cochlear Dies., renamed), t. h. Sterna cantiaca, S. minuta; Brazil. 1860: Dist. [Microlistrum cochlear.]

differens Sons., 1891, 261, t. h. Cantharus lineatus.—1891: Trochopus.

difformis Wagener, 1857, 63, t. h. Cyprinus erythrophthalmus.—1857: Dactylogyrus.

diffusocaleiferum Gastaldi, 1854, 5, t. h. Rana esculenta.—1854: Dist.

digitata Mont., 1903a, 309, t. h. Palemonetes argentinus.—1902: Temnocephala.

digitatum Rathke, (1843), 242, t. h. Hippoglossus gigas; Norway.—1843: Octobothrium. [1850: Diclidophora palmata.] [1879: Octobothrium palmatum.]

digitatus Looss, 1899b, 641, t. h. Sphyræna vulgaris; Egypt.—1899: Hemiurus. 1901: Lecithochirium. 1907: Plerurus (type).

dilatatum Fischer de Waldheim, 1840a, 158, t. h. Gallus communis; Vilnæ.—1840: Dist. 1860: Echinost. [1892: E. echinatum.]

dilatatus Daly, 1905, 233, t. h. Colossoma brachypoma; Paraguay.—1905: Chiorchis.

dilutatum Schneidemuehl, 1896, 303, misprint for dilatatum (Dist.).

dimidiatum Crep., 1829, 55, t. h. Acipenser sturio.—1859: Dist.

dimorphum Dies., 1850a, 353 [contains D. marginatum Rud., 1819a, 680, and Duj., 1845a, 446], t. h. Salmo carapus, etc., see page 184; Brazil.—1850: Dist. 1886: D. (Brachylaimus). 1899: Clinost.

dimorphum of Wagener, 1852, 555, see commutatum 1858, from chicken.—1852: Dist. 1890: Mesogonimus.

diodontis Oken, 1815, 182, t. h. Diodon sp.; Nolka to Cal.—1815: Phylline (type of P. Oken, teste Odhn.). [Trist. maculata.] [Capsala martinieri.]

diplachanthus Massa, 1903, 254, t. h. Trigla hirundo.—1903: Trochopus.

diplocotyla Pag., 1857, 25, t. h. Planorbis marginatus.—1857: Cerc. [1858: Diplocotyle mutabile.] [1885: Amphist. subclavatum.]

diplodiscoides Cohn, 1904, 240, t. h. Rana esculenta.—1902: Opisthodiscus (type).

diplorchis Odhn., 1905, 318, t. h. Lumprenus medius; Spitzbergen, off King's bay.—1905: Monorcheides (type).

[*dipsacum* Lint., 1897a, 806, cestode (Octobothrium).]

discus Mueller, 1786, 138, pl. 20, fig. 3, in aqua palustri raro.—1786: Cerc. 1829: Cyclidium.

discrialis Ssinitzin (1896), in Rallus aquaticus.—1896: Notocotyle.

dispar Looss, 1902, 888, t. h. dogs and cats; Egypt.—1902: Heterophyes.

disticha Mueller, 1776, 224. 1776: Fasc. 1803: Dist.

distomatosa Linst., 1889a, 118, based on Sons., 1884, 98, t. h. Cleopatra bulimoides; near Cairo, Egypt.—1889: Cerc.

distomi folii Looss, 1894a, 251.—1894: Cerc. [Dist. folium.]

distomi hepatici Looss, 1894a, 252.—1894: Cerc. [Fasc. hepatica.]

distomi homolostomi Linst., 1889a, 120, t. h. Limnæa stagnalis.—1889: Cerc. [Dist. holostomum.]

distomi militaris Braun, 1893a, 832.—1893. Cerc. [Dist. militare.]

distomi perlati Looss, 1894a, 32.—1894: Cerc. [Dist. perlatum.]

distomi retusi Linst., 1878a, 327, in Limnæa stagnalis.—1878: Cerc. [Dist. retusum.]

divergens Rud., 1809a, 371, Fasc. blennii renamed, t. h. Blennius viviparus.—1809: Dist.

divergens Looss, 1902e, 640, t. h. Ranzania truncata; Triest.—1902: Orophocotyle.

dolichocotyle Cohn, 1903, 37, t. h. Herpetodryas fuscus.—1903: Amphist. 1904: Catadiscus (type).

donavani Mont., 1888, 16, for donavini (Microcotyle).

donavini Ben. & Hesse, 1863; 1864, 114, t. h. Labrus donavini.—1863; 1864: Microcotyle (?type).

draconis Briot, 1904, 126, t. h. Trachinus draco; North Sea.—1904: Microcotyle.

dubia Gœze, 1782a, 177, see alata.—1782: Plan.

dubium Leidy, 1856, 45, t. h. Rusticola minor.—1856: Clinost. 1858: Dist.

dubium Cobbold, 1860, 45, t. h. Corvus corone.—1860: Holost. [1858: H. corones.]

dubium Cobbold, 1858b, 156 t. h. Gasterosteus spinachia.—1858: Monost. 1892: Monostomulum.

dubius Klein, 1905, 68, t. h. Coluber olivaceus.—1905: Halipegus.

dujardini MacCallum, 1904, 547, for dujardinii (Echinost.).

dujardinianus Dies., 1850a, 432, t. h. Cyprinus carpio, Leuciscus rutilus.—1850: Gyrodactylus. 1858. Dactylogyrus.

dujardinii Cobbold, 1860a, 37, Dist. histrix Duj., 1845a, 433, D. histrix Dies., 1850a, 393, renamed; t. h. Pleuronectes maximus, P. platessa—1860: Echinost.

dujardinii Cobbold, 1860a, 29, D. soleæ 1845, renamed, t. h. Solea vulgaris, see Pleuronectes solea.—1860: Dist.

dujardinii Dies., 1850a, 420, t. h. Cyprinus erythrophthalmus.—1850: Diporpa (type). [1879: Diplozoon paradoxum, type.]

dujonii Braun, 1893a, 917, see also dujonis (Monost.).

dujonis Leuck., (1874), 419, t. h. Halicore dujong.—1874: Monost.

duplicata Baer, 1826, 124, t. h. Anadonta ventricosa; Regiomontii.—1826: Dist. 1856: Cerc. [1850: Rhopalocerca tardigrada, type.]

duplicatum Rud., 1819a, 125, Polyst. thynni 1811, renamed, t. h. Scomber thynnus; Balearic Isles.—1819: Polyst. 1845: Polyst. (Hexacotyle). 1850: Plagiopeltis (type).

ecaudata Eichwald, 1829a, 248, t. h. Lymnæus stagnalis.—1829: Cerc.

echeneidis remoræ Rud. (1821–8), 163, t. h. Echeneis remora.—18—?: Dist.

echeneis Wagener, 1857, 99, t. h. Chrysophrys aurata.—1857: Dactylogyrus. 1889: Diplectanum.

echinata Dies., 1858e, 367, new name for Dist. cyprini idi (peritonei), see Duj., and T. acerinæ cernuæ, t. h. Leuciscus idus, Acerina cernua; Europe.—1858: Tetracotyle.

echinata Sieb., 1837, 187, t. h. Lymnæus stagnalis: Gedani.—1837: Cerc. 1855: Cerc. (Hormocerc.). 1858: Cerc. (Nephrocephala). [1858: Dist. echinatum.] 1861: Dist.

echinata Nord., 1840, 621.—1840: Fasc. [1840: F. trigonocephala.]

echinatoides Fil., 1854, 266, t. h. Paludina vivipara, P. achatina; Lake Varese, Lombardy.—1854: Cerc. 1855: Cerc. (Hormocerc.). 1858: C. (Nephrocephala). [1858: Dist. echiniferum.]

echinatoides Dies., 1858d, 263, for echinatoides anodontæ.—1858: Dist.

echinatoides anodontæ Pag., 1857, 32, t. h. Anadonta cygnea.—1857: Dist.

echinatum Linst., 1878, 223, t. h. Pandion haliaëtos.—1878: Monost.

echinatum Fil., 1837a, 338, t. h. Paludina impura; Italy.—1837: Heterost. (type). 1858: Cercariæum.

echinatum Zed., 1803a, 220, t. h. Anas domestica, A. querquedula; includes: Cucullanus conoideus Bloch, 1782; Planaria teres Gœze, 1782; Dist. anatis Zed., 1800; Festucaria anatis Schrank; Fasc. anatis Gmelin.—1803: Dist. 1828: Echinost., type. 1809: D. (Echinost.).

echinifera LaValette, 1855, 14, t. h. Paludina vivipara.—1855: Cerc. 1855: Dist. [1856: Cerc. echinatoides.] [1858: C. (Nephrocephala) echinatoides.] [1873: Dist. militare.] 1892: Echinost.

echiniferum paludinæ Pag., 1857, 30, t. h. Paludina vivipara.—1857: Dist.

echinocephalum Rud., 1819a, 115, t. h. Falco milvus; includes D. milvi.—1819: Dist. (Echinost.). 1860: Echinost.

echinocerca Fil., 1855b, 17, t. h. Buccinum linnæi; Golf de Gênes.—1855: Cerc. 1858: Histrionella. [1858: Dist. appendiculatum.]

echinostomum Dies., 1850a, 326, t. h. Cathartes aura and Sula fusca; Brazil; includes Dist. planicolle Rud., from Pelecanus sula in Brazil.—1850: Monost. [1902: Anoictost. planicolle.]

echiuri Greef, 1879a, 130, t. h. Echiurus pallasi.—1879: Dist.

efemera Ssinitzin, 1905, 158, for ephemera (Cerc.).

ehrenbergii Focke, 1836a, 191.—1836: Planaria.

elaphi Gmelin, 1790a, 3054, cervi renamed, t. h. Cervus elaphus.—1790: Fasc. 1800: Monost. [1850: Amphist. conicum.]

elegans Baer, 1826, 125, t. h. Stör=Acipenser sturio.—1826: Nitzschia (type). 1864: Trist.

elegans Ben., 1858a, 1861a, 60, t. h. Sciæna aquila; Belgium.—1858, 1861: Calceost. (type.)

elegans Dies., 1858e, 364, new name for Epibdella sciænæ, t. h. Sciæna aquila; near Ostend.—1858: Benedenia (type).

elegans Goto, 1894a, 188, t. h. Scombrops chilodipteroides; Japan.—1894: Microcotyle.

elegans Looss, 1899b, 692, t. h. Phœnicopterus roseus; Gizeh.—1899: Echinost.

elegans Mont., 1890, 191, Raja clavata; Naples.—1890: Acanthocotyle.

elegans Mueller in LaValette, 1855, 13, free form.—1855: Cerc. 1858: Histrionella.

elegans Olss., 1868, or 1869, 2, t. h. Chimæra monstrosa; Skagerrack.—1868: Macraspis (type). [1888] 1891: Aspidogaster.

elegans Rud., 1802, 65, t. h. Fringilla domestica; Greifswald.—1802: Fasc. 1809: Dist. 1845: D. (Brachylaimus). 1902: Plagiorchis.

elegans Nord., 1832, 106, t. h. Cyprinus brama.—1832: Gyrodactylus (type).

elegans Nord., 1840, 597, 600, includes crassicaudatum (Diklibothrium), t. h. Acipenser stellatus.—1840: Hexacotyle.

elephantis Dies., 1858, 354, based on Jackson, 1847, 317, t. h. Elephas indicus.—1858: Dist. 1892: Cladocœlium.

elipticum Stoss., 1886, 64, for ellipticum Mol., 1858.—1886: D. (Echinost.).

ellicticum Mont., 1892, 715, for ellipticum (Monost.).

elliptica Dies., 1850a, 421, t. h. Labrax mucronatus.—1850: Plectanocotyle (type). 1858: Plectanophorus (type).

ellipticum Mol., 1858, 130, t. h. Acipenser nasus; Patavii.—1858: Dist. 1886: D. (Echinost.).

ellipticum Brand., 1888a, 59, t. h. Piaya cayana; Brazil.—1888: Hemist.

ellipticum Brand., 1888a, 67, t. h. Bubo magellanicus; Brazil.—1888: Holost.

ellipticum Rud., 1809a, 333, M. bombynæ 1800, renamed.—1809: Monost. (Monost.). [1853: Dist. variegatum.]

ellipticus Pratt, 1903, 25, t. h. Heterodon platyrhinus; North America.—1903: Renifer (type).

elongata Goto, 1894a, 210, t. h. Pagrus tumifrons; Mogi and Hakodate, Japan.—1894: Diclidophora.

elongata Nitzsch, 1826, 150, t. h. Stör.—1826: Trist. 1840: Capsala. [1850: N. elegans.] 1865: Nitzschia.

elongatum Mehlis, 1831, 177, t. h. Larus argentatus, L. marinus, L. ridibundus.—1831: Dist.

elongatum J. Poir., 1883, 76, t. h. Palonia frontalis; Java.—1883: Gastrothylax. 1903: Amphist.

elongatus Pratt, 1903, 25, t. h. Heterodon platyrhinus; North America.—1903: Renifer.

emarginata Olss., 1876, 11, t. h. Raja clavata.—1876: Onchocotyle. 1890: Octocotyle.

emarginatum Rud., 1819a, 124.—1819: Pentast.

emarginatum Dies., 1839a, 237, t. h. Callithrix noctivaga; Matogrosso, Brazil.—1839: Amphist.

ematobia Sons., 1884, 20, for hæmatobia (Bilharzia).

emberizæ citrinellæ Dies., 1836d, 253.—1836: Amphist.

embryo Olfers, 1816, 110, t. h. Perca vulgaris, P. cernua.—1816: Dist.

emendatus Braun, 1901g, 895, new name for Dist. meropis of Par. [not of Rud.]= Megacetes triangularis of Looss [not D. triangulare Dies.]; t. h. Merops apiaster.—1901: Eumegacetes (type).

[*endemica* Sons., 1884, 17, not as specific name.—1884: Dist. 1884: Bilharzia.]

endemicum Bælz, 1883, 235, t. h. Homo; Japan.—1883: Dist. hepatis. 1892: D. (Brachylaimus). [Opisthorchis sinensis.] 1907: Clonorchis.

endemicum hepatis St.-Remy, 1883, 528, cf. hepatis endemicum.—1883: Dist.

endobala Ssinitzin, 1906, 685, for endoloba (Opisthioglyphe).

endobola Ssinitzin, 1905, 121, for endoloba (Opisthioglyphe).

endoboluum Mont., 1891, 110, for endolobum (Dist.).

endolobium Gurlt, 1845a, 288, for endolobum (Dist.).

endolobum Duj., 1845a, 397, t. h. grenouilles vertes et rousses, et la Salamandre; Rennes.—1845: Dist. 1899: Opisthioglyphe (type).

engæi Haswell, 1893e, 97, t. h. Engæus fossor; Gippsland.—1893: Temnocephala.

engei Mont., 1899, 83, for engæi (Temnocephala).

enterarchos de Fil.—Dist. [1896: D. crassicolle.]

entzi Ratz, 1900, 534, t. h. Ardea purpurea.—1900: Opisthorchis.

epatica Brera, 1809a, 92, for hepatica (Fasc.).

epatica Rosa, 1794, 5, in Ardea purpurea.—1794: Fasc. [1850: Dist. heterostomum.] [1900: ? Clinost. heterostomum.]

epatico Galli-Valerio, 1893a, 178 (Dist.), see hepatica.

ephemera Nitzsch, 1807, 33, t. h. Planorbis corneus; Halle.—1807: Cerc. 1828: Histrionella H. & E., type. [1858: Glenocerc. flava.] [1858: Dist. trigonocephalum.]

epiclitum Fischder., 1904, 458, t. h. Bos taurus indicus, Buffelus indicus; Cochin China.—1904: Paramphist.

equi Gmelin, 1790a, 3054, t. h. Equus caballus.—1790: Fasc. hepatica.

equi Burke, 1882a, 322, t. h. Equus caballus.—1882: Hæmatobium.

ercolani Mont., 1893, 40, for ercolanii.—1893: Dist.

ercolanii Mont., 1893, 40.—1893: Dist. 1895: D. (Dicrocœlium). 1901: Telorchis.

ericetorum Linst., 1898, 761, t. h. Xerophilus ericetorum; near Gœttingen, Germany.—1898: Cerc.

erinacei E. Bl., 1847a, 300, t. h. Erinaceus europæus; Paris.—1847: Brachylæmus. [1850: Dist. linguæforme.] 1889: Dist. [1898: Mesogonimus.]

erinaceum Poir., 1886, 37, t. h. Delphinus delphis.—1886: Dist. 1892: D. (Dicrocœlium). [1899: ?Astia.] 1904: Astiotrema.

eriocis Mueller, 1784, 92; [1788], 42, t. h. Salmo eriox.—[1788]: Fasc. 1803: Dist. [1850: D. hyalinum.]

erraticum Rud., 1819a, 120, t. h. Fringilla linaria, Motacilla alba, Parus cœruleus, P. major, P. palustris, P. pendulinus.—1819: Dist. 1899: Plagiorchis.

erraticum Rud., 1808a, 458; 1809a, 344, t. h. Larus septentrionalis; Greifswald, Europe.—1808: Amphist. 1845: Holost.

erythrini Ben. & Hesse, 1863, 115; 1864, 115, t. h. Pagellus erythrinus.—1863: Microcotyle.

erythrinis Braun, 1890a, 418, for erythrini (Microcotyle).

erythrops Dies., 1855a, 400, based on Cerc. paludinæ impuræ Baer, 1827b, 655.—1855: Cercariæum. 1858: Histrionellina.

esmarkii Scott, 1901, 147, t. h. Gadus esmarkii; Shetland.—1901: Octobothrium.

esocis lucii Rud., 1809a, 438, based on Rud., 1803, 29.—1809: Dist.

euculus McCrady, 1874, misprint for cuculus (Bucephalus).

euryporum Looss, 1896, 144, t. h. Milvus parasiticus; Cairo, Egypt.—1896: Echinost.

eurystomum Linst., 1877, 183, t. h. Anas clangula.—1877: Dist. 1892: D. (Dicrocœlium).

eustemma Brand., 1888a, 65, Eustemma caryophyllum renamed, t. h. Accipiter pileatus; Brazil.—1888: Holost.

exacantha Mont., 1891, 104, for hexacantha (Placunella).

exachanthus Massa, 1903, 255, for hexacanthus (Trochopus).

exasperatum Rud., 1819a, 117, t. h. Sorex eremita; Mus. Vienna.—1819: Dist. 1819: D. (Echinost.). 1845: D. (Brachylaimus).

excavata Rud., 1803a, 28, t. h. "Storch," Ardea ciconia; Greifswald.—1803: Fasc. 1809: Dist. 1819: Holost. 1819: Amphist. 1850: Hemist.

excavatum Nord., in Dies., 1850a, 428, renamed nordmanni 1850, in Brama mediterranea.—1850: Trist. [1850: Encotyllabe nordmanni.]

excisiforme Cohn, 1902k, 54, t. h. Scomber scomber.—1902: Lecithocladium.

excisum Mont., 1891, 520, for excisum (Apoblema).

excisum Rud., 1819a, 112, t. h. Scomber scomber at Arimini; S. colias at Naples.—1819: Dist. 1828: Fasc. 1845: Dist. (Crossodera). 1886: D. (Apoblema). 1889: Apoblema. 1899: Hemiurus. 1901: Lecithocladium (type). 1902: D. (Lecithocladium).

excisum Linst., 1906, 12, t. h. Ægolius otus, Strix flammea.—1906: Holost.

exfoliata Moul., 1856a, 87, new name for Dist. of Leucochloridium paradoxum.—1856: Cerc.

exigua Looss, 1896, 230, t. h. Cleopatra bulimoides; Egypt.—1896: Cerc.

exiguum Mueh., 1898, 17, t. h. Circus rufus.—1898: Dist. 1898: Opisthorchis. 1899: Holometra (type).

exiguum Mehlis in Crep., 1846, 145, t. h. Cygnus musicus.—1846: Holost.

exile Stoss., 1902, 17, t. h. Totanus ochropus.—1902: Cyclocœlum.

exilis Looss, 1899b, 628, t. h. Bagrus bayad; Cairo, Egypt.—1899: Leptalea (type). 1900: Emoleptalea (type).

exocati Par. & Perugia, 1893, 1, includes Monost. filum G. Wagener [not Duj.], t. h. Exocœtus volitans; Genova.—1893: Didymozoon.

expansum Crep., 1842, 327, t. h. Aquila haliaëtos.—1842: Monost. 1892: Dist. 1901: Tocotrema. 1903: Scaphanocephalus (type).

explanatum Crep., 1847, 34, t. h. Bos taurus indicus; Berlin.—1847: Amphist. 1904: Paramphist.

exspinosum Hausmann, 1896, 391, t. h. Barbus fluviatilis.—1896: Dist. [D. perlatum.] 1899: Asymphylodora.

faba Bremser in Schmalz, 1831, 11, t. h. Parus major, Silvia sibilatrix, Motacilla boarula.- 1831: Monost. 1860: Wedlia. 1904: Monostromum, misprint.

fabaceum Dies., 1838, 189, in Manatus australis; 1839a, 236, in Manatus exunguis; at Borba and Forte do Rio Branco, Brazil.—1839: Amphist. 1901: Chiorchis (type).

fabrii Mol., 1859, 289, t. h. Cantharus vulgaris; Batavii.—1859: Dist. 1886: D. (Brachylaimus).

factum Mont., 1893, 32, misprint for fractum (Dist.).

falcatus Wedl, 1857, 258, t. h. Cyprinus sp.—1857: Gyrodactylus. 1858: Dactylogyrus.

falcolacæ Leidy MS. in Stiles & Hass., 1894d, 250.- 1894: Dist. [probably trapezium].

falconis chrysaëti Rud., 1809a, 429, D. felleum falconis chrysaëti; Viborg.—1809: Dist.

falconis milvi Rud., 1809a, 429, for Fasc. milvi Gmelin.—1809: Dist.

falconis patumba Baird, 1853a, 47.—1853: Amphist. [1853: Holost. macrocephalum.]

falconis palumbarii Rud., 1819a, 88, syn. of macrocephalum (Amphist.).

falconis palumbi Viborg, 1795, 243.—1795: Strigea. 1809: Amphist.

falconis peregrini Rud., 1819a, 92, t. h. Falco peregrinus; Berlin, Germany.—1819: Amphist.

falconis rufi Rud., 1819a, 119, t. h. Falco rufus; Cat. Ent. Vien.—1819: Dist. [1850: D. lineola.]

falconum Dies., 1858, 322, t. h. Falco nisus, F. rufus; Ireland.- 1858: Holost.

fallax Rud., 1819a, 117, t. h. Uranoscopus scaber; Naples.—1819: Dist. (Echinost.). 1860: Echinost. 1899: Anoiktost. 1901: Anisogaster (type). 1902: Anisocladium (type).

fallax Dies., 1850a, 297, Cerc. VII Baer, C. echinata Sieb., Dist. pacifica Steenstrup, renamed; t. h. Paludina vivipara; Regiomontii (Baer).- 1850: Cerc. 1855: C. (Eucerc.). [1858: Dist. militare.] 1858: C. (Gymnocephala).

fallax Wagener, 1857, 55, t. h. Cyprinus erythrophthalmus, C. rutilus.—1857: Dactylogyrus.

farionis Mueller, 1784, 91, t. h. Salmo fario; [1788], 42.—[1788]: Fasc. [1814: Dist. laureatum.] 1891: Dist.

fasciata Haswell, 1887a, 284, t. h. Astacopsis serratus; N. S. Wales.—1887: Temnocephala.

fasciatum Rud., 1819a, 97, t. h. Labrus tinca, L. merops, Perca marina; Naples.—1819: Dist. 1886: D. (Dicrocœlium). [1899: Creadiinæ.] 1901: Allocreadium. 1902: Helicometra. 1902: Loborchis.

fasciatus Stoss., 1902, 25, t. h. Numenius arquatus; locality?.—1902: Ilæmatotrephus.

fascicularis Villot, 1875, 480, t. h. Nassa reticulata; Roscoff.—1875: Cerc.

fasciolaris Mueller, 1788.—1788: Hirudo. [1790: Fasc. anatis.] [1850: Dist. ovatum.]

fastosum Braun, 1901g, 896, t. h. Caprimulgus sp., Squatarola helvetica; Brazil.—1901: Stomylotrema.

felineum Rivolta, 1884, 20, t. h. Felis catus dom.; Italy.—1884: Dist. 1893: D. (Dicrocœlium). 1895: Opisthorchis (type). 1896: Dicrocœlium. [1896: Prosthometra, type.] 1898: Campula. ——: Dist. (Opisthorchis).

felineum of Ward, 1895, 152, see pseudofelineum.—1895: Dist.

felinum Ratz, 1896, 67, misprint for felineum (Dist.).

felleum falconis chrysaëti Viborg, 1795, 243.—1795: Dist. [1850: D. crassiusculum.]

fellis Olss., 1868, 44, t. h. Anarhichas lupus.—1868: Dist. 1886: D. (Brachylaimus).

ferocis Mont., 1888a, 14, apparently for ferox (Dist.).

ferox Rud., 1795a, 15, t. h. Ardea ciconia; Greifswald.—1795: Fasc. 1803: Dist. 1809: D. (Echinost.). 1828: Echinost.

ferruginosum Linst., 1877, 184, t. h. Barbus fluviatilis.—1877: Dist. [1894: D. perlatum.]

ferrum-equinum Dies., 1836d, 238, t. h. Cataphractus murica, C. corome; Cuyaba and Matogrosso, Brazil.—1836: Amphist.

festæ Borelli, 1898, 6 pp.—1898: Plan.

filaria Bosc, 1802a, 261.—1802: Plan.

filarina Ben., 1858 or 1861, 108, t. h. Sciæna aquila; Ostend.—1858: Nematobothrium (type). 1859: Monost.

filicolle Rud., 1819a, 85, t. h. Brama raji; Naples.—1819: Monost. (Monost.). 1858: Dist. 1860: Köllikeria (type). 1886: D. (Köllikeria).

filicolle Mont., 1893, 150.—1893: Didymozoon.

filiferum Sars, 1885, 222, t. h. Nematoscelis megalops, Thysanoëssa gregaria; South Atlantic Ocean.—1885: Dist.

filiforme Rud., 1819a, 112, t. h. Cepola tænia, at Arimini; C. rubescens.—1819: Dist.

filigerum Rud., teste Risso, 1826, 262, de la castagnolle.—1826: Monost.

filum Duj., 1845a, 418, t. h. moineaux; Rennes.—1845: Dist. (Brachylaimus).

filum Duj., 1845a, 362, t. h. Scomber scombrus; Rennes.—1845: Monost.

fimbriata Gœze, 1782a, 180.—1782: Fasc. [1810: Caryophyllæus mutabilis.]

fimbriatum Busch, 1851, 99, t. h. Sagitta.—1851: Dist.

fimbriatum Mol., 1859, 819, t. h. Anguilla vulgaris; Batavii.—1859: Gasterost.

fimbriatum Sieb., 1848, v. 1, 129, t. h. Perca fluviatilis, Lucioperca; Europe.—1848: Gasterost. (type).

fintæ Ben. & Hesse, 1863, 1864, 101, t. h. Alosa finta.—1863: Ophicotyle (type). 1879: Octobothrium.

fintæ Mont., 1888a, 13.—1888: Glossocotyle.

fissa Bory de St. Vincent, 1824a, 456.—1824: Histrionella. [1850: Malleolus furcatus.]

fissicanda Moul., 1856a, 109, for fissicauda (Cerc.).

fissicauda Dies., 1858d, 243, cristata Valette renamed.—1858: Lophocerc. (type).

fissicauda Dies., 1858d, 269, ocellata (Cerc.) renamed.—Histrionellina.

fissicauda La Valette, 1855, 21, t. h. Limnæus stagnalis.—1855: Cerc. 1858: C. (Schizocerca).

fissicaudata Mont., 1888, 196, for fissicauda (Cerc.).

flaccida Mueller, 1774, 57, free form.—1774: Fasc. 1776: Plan.

flagellatum Moniez, 1891, 27, t. h. Gymnotus electricus.—1891: Dist.

flava Stoss., 1903, 373, t. h. Centropristis hepatus; Triest.—1903: Helicometra.

flava La Valette, 1855, 24, C. ephemera Nitzsch renamed.—1855: Cerc. 1858: Glenocerc. 1858: Monost. [See flavum.]

flavescens Ben., 1870, 47, t. h. Gobius jozo, G. minutus.—1870: Dist. 1886: D. (Brachylaimus).

flavescens Pag., 1857, 34, t. h. Bulimus radiatus; Heidelberg.—1857: Dist. 1858: Cercariæum.

flavocinctum Linst., 1879, 183, t. h. Anguis fragilis.—1879: Dist. [1897: D. crassicolle.]

flavopunctata Par., 1894, 703, for fulvopunctata (Cerc.).

flavum Mehlis, 1831, 172, t. h. Anas mollissima, A. fusca, A. marila, A. fuligula.—1831: Monost. 1858: Glenocerc. 1902: Typhlocœlum (type). [See flava.]

flexum Lint., 1892, 98, t. h. Oedemia americana.—1892: Dist. 1899: Echinost.

flexuosum Rud., 1808a, 346; 1809a, 50, t. h. Talpa europæa.—1809: Dist. 1845: D. (Dicrocœlium). 1899: Omphalometra (type).

fodicans Braun, 1901g, 896, t. h. Sterna nigra; Vien. Mus. no. 631.—1901: Cathæmasia.

fœcundum Lint., 1900, 269, t. h. Lopholatilus chamæleonticeps.—1900: Dist.

fœtorii Linst., 1876, 1, t. h. Fœtorius putorius.—1876: Tetracotyle.

foliaccum Mol., 1859, 288, t. h. Gobius paganellus; Batavii.—1859: Dist.

foliaceum Rud., 1819a, 83, t. h. Accipenser sturio; Arimini.—1819: Monost. (Monost.). 1859: Amphilina.

foliaccum Goto, 1894a, 248, host unknown.—1894: Trist.

foliatum Lint., 1898, 532, t. h. Mola mola.—1898: Dist. 1902: Orophocotyle. 1904: Accacœlium.

folii Looss, 1894a, 256, Dist. duplicatum.—1894: Cerc.

foliiforme Crep., 1846, 149, t. h. Squalus griseus.—1846: Dist.

foliiforme Braun, 1899g, 490, t. h. Ardea purpurea; Italy.—1899: Clinost.

folium Olfers, 1816, 45, t. h. Esox lucius.—1816: Dist. [1894: Rhopalocerca tardigrada, type.] 1899: Spathidium (type). 1899: Phyllodist. (type). [1906: Gorgoderina.]

forceps Leuck. (1857), 26.—1857: Dactylogyrus.

forcipata Mueller, 1786, 134, in aqua palustri rarissime.—1786: Cerc. 1827: Dicranophorus.

formosum Sons., 1890, 134, t. h. Grus cinerea.—1890: Dist. 1892: Polyorchis.

formosum Staff., 1904, 486, t. h. Hippoglossus hippoglossus; Canada.—1904: Steganoderma (type).

formosum Pratt, 1903, 34, t. h. a frog.—1903: Ostiolum (type).

fractum Rud., 1819a, 107, t. h. Sparus salpa; Naples.—1819: Dist. 1886: D. (Podocotyle). 1898: Podocotyle.

fragile Lint., 1900, 269, t. h. Mola mola.—1900: Dist. 1904: Stenocollum (type).

fragile Olss., 1869, 4, t. h. Raja batis; Norway.—1869: Microbothrium. 1890: Pseudocotyle. [1897: Micropharynx parasitica, type.]

fraterculus Odhn., 1905, 343, t. h. Phoca barbata, Odobenus rosmarus; Spitzbergen.—1905: Orthosplanchnus.

fraterna Odhn., 1902, 19, t. h. Harelda glacialis.—1902: Cyathocotyle.

fraternum Looss, 1894, 42, t. h. Pelecanus onocrotalus; Egypt.—1894: Dist. 1899: Cœnogonimus. 1899: Cotylogonimus. 1902: Heterophyes.

frolichii Kowal., 1894, 3.—1894: Dist. 1894: Echinost. [1898: E. conoideum.]

fulgopunctata Braun, 1893a, 831 for fulvopunctata (Cerc.).

fuligula ferina Dies., 1858c, 355, based on Bellingham, 1844, v. 13, 430, t. h. Anas ferina; Ireland.—1855: Dist. [1892: Echinost. echinatum.]

fulva Bosc., 1802a, 257.—1802: Plan.

fulvopunctata Erc., 1881 or 1882, see Par., 1894, 161, t. h. Bythinia tentaculata; Bologna. Cerc.

fulvum Rud., 1819a, 98, t. h. Gadus molva at Naples; G. mediterraneus.—1819: Dist.

fulvum Duj., 1843, 340, t. h. Sorex.—1843: Brachylaima.

furcata Nitzsch, 1817, 49.—1817: Cerc. 1838: Malleolus (type).

furcatum Brenser, in Rud., 1819a, 107, t. h. Mullus surmuletus, M. rubescens at Arimini; Gadus molva at Naples.—1819: Dist. 1828: Fasc. 1845: D. (Podocotyle). 1898: Podocotyle.

[*furcatæ* Eichwald, 1829a, 247.—Cerc.]

furcigerum Olss., 1868, 26, t. h. Pleuronectes limanda, P. limandoides.—1868: Dist. 1886: D.(Dicrocœlium). 1904: Leioderma (type). 1905: Steringophorus (type).

fusca Bosc., 1802, 271, in dorade.—1802: Fasc. 1885: Dist.

[*fusca* Sluiter, 1900, 7, (Dist.), a tunicate.]

fusca Pallas, 1774, 21, in aq. stag.; Europe.—1774: Fasc.

fusca Fabricius, 1798, 58, syn. Fasc. angulata.—1798: Plan.

[*fusca*, (Diplost.) mammal.]

fuscatum Rud., 1819a, 101, t. h. Tetrao coturnix; Ancona.—1819: Dist. ——: D. (Dicrocœlium). 1902: Harmost.

fuscescens Rud., 1819a, 113, t. h. Sparus dentex; Arimini.—1819: Dist. 1886: D. (Dicrocœlium).

fuscescens Fabricius, 1798, 58.—1798: Plan.

fusiforme Luehe, 1901, 476, t. h. Conger conger; Coll. Berlin.—1901: Lecithochirium.

fusiforme Zed., 1800a, 163, Fasc. upupæ Schrank, 1790, renamed.—1800: Dist. [1850: D. involutum.]

fusiformis Goto, 1894a, 192, t. h. Centronotus rubulosus; Japan.—1894: Microcotyle.

gadi Dies., 1855, 64, based on Bellingham, 1844, 428, t. h. Gadus æglefinus; Ireland.—1855: Dist.

gadi æglefini Dies., 1858e, 341, based on Bellingham, 1844, 428; renamed anonymum 1858e, 341.—1858: Dist.

gadorum Ben., 1870, 60, t. h. Merlangus carbonarius.—1870: Echinost.

gadorum Rathke, 1799, 68.—1799: Hydatula. 1851: Nematoideum. 1878: Gasterost.

galactosomum Leidy, 1888i, 166, t. h. Labrax lineatus; U. S. A.—1888: Dist.

galeatum Rud., 1819a, 86, t. h. Centronotus glaucus; Naples. — 1819: Monost. (Monost.). 1898: Gasterost.

gammari Rentsch, 1860, 35, t. h. Gammarus ornatus.—1860: Dist.

gammari Linst., 1877, 186, t. h. Gammarus pulex.—1877: Dist.

gammari ornati Rentsch, 1860, pl. 12, fig. 2, see gammari (Dist.).

garzettæ MacCallum, 1904, 541, t. h. Garzetta nigripes Temm.—1904: Echinost.

gastrocolum Leidy, 1891a, 414, t. h. Trichiurus lepturus; U. S. A.—1891: Dist.

gastroporus Luehe, 1901p, 166, t. h. Rana cyanophlyctis; India.—1901: Pleurogenes.

gelatinosum Rud., 1819a, 102, t. h. Testudo mydas; Arimini.—1819: Dist. 1895: D. (Dicrocœlium). 1901: Rhytidodes (type).

gelatinosum of Poir., see poirieri.

gemellatum Mont., 1892, 716, for gemellum (Monost.).

gemellum Steenstrup, 1860, 113, t. h. Sphyræna barracuda.—1860: Monost.

geminum Bremser in Schmalz, 1831, 13, for M. faba.—1831: Monost. [1853: M. faba.]

geminum Looss, 1896, 50, t. h. Milvus parasiticus; Cairo.—1896: Dist. 1898: Opisthorchis.

genata Looss, 1907, 488, t. h. Pelecanus onocrotalus; Egypt.—1907: Pygidiopsis (type).

geniculatum Dies., 1850a, 373, D. physophoræ renamed, t. h. Physophora tetrasticha; Naples.—1850: Dist.

genu Rud., 1819a, 107, t. h. Labrus luscus; Naples.—1819: Dist. 1901: Allocreadium.

gesserensis Bosc, 1802a, 262.—1802: Plan.

giardi Stoss., 1898, 50, for giardii (Dist.).

giardii Stoss., 1889, 25, t. h. Naucrates ductor; Triest.—1889: Dist.

gibba Mueller, 1773, 120, in infusione jungermanniæ tamarisci.—1773: Cerc. 1827: Macrocercus.

gibba Fil., 1854b, 266, t. h. Lymnæus peregr.—1854: Cerc. 1855: C. (Xiphidiocerc.). 1858: C. (Acanthocephala).

gibbosa Rud., 1802b, 81, t. h. Esox belone.—1802: Fasc. 1809: Dist. 1845: D. (Podocotyle). 1901: Lecithaster.

gibbum Mehlis in Crep., 1846, 137, t. h. Fulica atra.—1846: Monost.

giganteum Dies., 1858e, 331, gigantica Cobbold, 1855, renamed.—1858: Dist. 1892: Cladocœlium.

giganteum Dies., 1836d, 238, pl. 22, figs. 5–6, t. h. Dicotyles albirostris at Nas Frechas and Caiçara, and D. torquatus at Matogrosso; Brazil.—1836: Amphist. 1901: Cladorchis (Stichorchis, type).

gigantica Cobbold, 1855a, 262, t. h. Giraffa camelopardalis.—1855: Fasc.

gigantocotyle Brand., in Otto, 1896, 103, t. h. Hippopotamus.—1896: Amphist.

gigas Nardo, 1827, 68, t. h. Proctostegus proctostegus.—1827: Dist.

glabrum Crep., 1846, 148, t. h. Salamandra maculosa.—1846: Dist.

glandulosum Looss, 1896, 64, t. h. Taphosus nudiventris; Ghizeh.—1896: Dist. 1899: Lecithodendrium.

glauca Mueller, 1774, 60.—1774: Fasc. 1787: Plan.

glauci Bergh, 1884, 18, t. h. Glaucus atlanticus, etc.—1884: Dist.

globicaudatum Crep., 1849a, 64, for globocaudatum (Dist.).

globifera Lamarck, 1816, 182, for globipora.—1816: Fasc. 1816: Dist.

globiparum Ehrenberg, 1837b, Feb., 199, for globiporum (Dist.).

globipora Rud., 1802b, 72, t. h. Cyprinus erythrophthalmus.—1802: Fasc. 1809: Dist. 1845: D. (Brachylaimus). 1886: D. (Dicrocœlium). 1898: Sphærost. (type).

globipora Erc., 1881 or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata; Bologna.—Cerc.

globiporum tincæ Rud., see Dies., 1850a, 395.—1850: Dist. [1850: D. perlatum.]

globocaudatum Crep., 1825, 49, t. h. Corvus cornix.—1825: Dist. 1845: D. (Brachylaimus).

globosum Ben., 1858a, 1861a, 193, quotes Siebold.—1858: Dist. [See also D. orbiculare.]

globulus Rud., 1814a, 104, t. h. Anas fuligula; Greifswald.—1814: Dist. [1902: Psilost.]

glottoides Klein, 1905, 72, t. h. Rana hexadactyla.—1905: Ganeo (type).

gobii Rentsch, 1860, 43, t. h. Gobius minutus.—1860: Dist.

gobii Stoss., 1883, 116, t. h. Gobius jozo, in int.; Triest.—1883: Dist. 1886: D. (Dicrocœlium). 1902: Loborchis. 1904: Helicometra.

gobii Stoss., 1898, 58, encysted on intest. of Gobius jozo; Triest, Austria.—1898: Agamodist.

gobii minuti Rentsch, 1860, for gobii Rentsch (Dist.).

goliath Ben., 1858b, 95, t. h. Balæna.—1858: Dist. [1902: Lecithodesmus (?type).] 1905: Lecithodesmus (type).

goliath of Lœnnberg, 1891, 71.—Dist. [1902: Lecithodesmus (type).]

gonocephala Ackermann, 1905, 137.—1905: Plan.

gorgoderæ cygnoides Kowal., 1904, 24, in Cyclas cornea; Dublany.—1904: Cerc.

loossi (Cerc.) Ssintizin, 1905, see under loossi.
pagenstecheri (Cerc.) Ssinitzin, 1905, see under pagenstecheri.
varsoviensis (Cerc.) Ssinitzin, 1905, see under varsoviensis.
vitelliloba (Cerc.) Ssinitzin, 1905, see under vitelliloba.

gorgon Lint., 1905, 327, t. h. Seriola lalandi; Beaufort, N. C.—1905: Gasterost.

gracile Fischder., 1901a, 368, t. h. Bos kerabau from Ceylon; Portax tragocamelus.—1901: Paramphist.

gracile Leidy, 1856, 45, t. h. Pomotis vulgaris, Esox.—1856: Clinost. (type). 1858: Dist.

gracile Rud., 1809a, 326, based on Acharius, 1790, 55, t. h. Salmo eperlanus.—1809: Monost. (Hypost.).

gracile Rud., 1819a, 89, t. h. Mergus merganser, M. albellus; Mus. Vienn.—1819: Amphist. 1845: Holost.

gracilescens Rud., 1819a, 111, t. h. Lophius piscatorius; Triest.—1819: Dist. 1852: Gasterost. 1858: Rhipidocotyle (?type). [Bucephalus haimeanus.]

gracilis Fil., 1837, 336, t. h. Planorbis nitidus; Italy.—1837: Redia (type). [1855: Diplocotyle mutabilis.]

gracilis Kath., 1894a, 129, t. h. see p. 278.—1894: Gyrodactylus.

gracilis La Valette, 1855, 20, t. h. Planorbis corneus.—1855: Cerc. 1858: C. (Schizocerca).

gracilis Wedl, 1861, 480, t. h. Hydrocyon dentex.—1861: Dactylogyrus.

gracilis Looss, 1901e, 660, t. h. Uranoscopus scaber; Triest.—1901: Anisogaster.

grande Dies., 1839a, 237, t. h. Chelys, Phrynops, Peltocephalus, Podocnemis, Rhinemys; Brazil.—1839: Amphist.

grande Rud., 1819a, 676-677, t. h. Platalea ajaja; Brazil.—1819: Dist. 1902: Mesaulus (type).

grande Dies., 1850a, 307, t. h. Ardea leuce, A. agami; Brazil.—1850: Diplost. 1890: Hemist. [1890: H. macropterum.]

grandiporum Rud., 1819a, 110, t. h. Muræna helena; Naples.—1819: Dist. 1886: D. (Apoblema). 1889: Apoblema. 1899: Hemiurus. 1901: Lecithochirium.

granulosum Looss, 1907, 483, t. h. Vesperugo kuhli; Cairo, Egypt.—1907: Lecithodendrium.

granulum Rud., 1809a, 394, includes Fasc. scorpii Mueller; t. h. Cottus scorpius.—1809: Dist.

grassum Biermer, 1863a, 395, for crassum (Dist.).

gregarius Looss, 1896b, 5, t. h. Egyptian buffalo; Egypt.—1896: Gastrothylax.

grisea Cerf., 1899a, 376, t. h. Hexacanchus griseus.—1899: Squalonchocotyle.

grisea Bosc, 1802, 257.—1802: Plan.

grœnlandicus Levin., 1881a, 78, t. h. Cottus scorpius; Egedesminde.—1881: Gyrodactylus.

grossa Mueller, 1774, 67.—1774: Fasc. 1776: Plan.

grossa Mueller, 1788, 21.—1788: Hirudo. 1865: Phylline. 1828: Malacobdella.

grossa Goto, 1894a, 220, t. h. Thynnus sp.; Misaki, Japan.—1894: Hexacotyle.

gruis Gmelin, 1790a, 3055, t. h. Grus.—1790: Fasc. 1803: Dist. [1850: D. echinatum.]

guernei Moniez, 1891, 148, t. h. Thynnus alalonga; Europe.—1891: Nematobothrium.

gulo Mueller, 1774, 56, free form.—1774: Fasc. 1776: Plan.

gulosum Lint., 1901, 415, t. h. Rhombus triacanthus.—1901: Dist.

gurltii Cobbold, 1860a, 42, t. h. Lacerta agilis.—1860: Monost.

gurnardi Ben. & Hesse, 1863, 1864, 103, t. h. Trigla gurnardus.—1863: Phyllocotyle (type).

gurnardi Ben. & Hesse, 1863, 1864, 96, t. h. Trigla gurnardus.—1863: Platycotyle (type).

[*gutturalis* (Bucephalus), reptile.]

gyrini Linst., 1884, 141, t. h. tadpole of Rana temporaria.—1884: Dist.

gyrinus Müeller, 1773, 64, in infusioni animali raro.—1773: Cerc. 1827: Macrocercus.

hæmatobe Ben., 1858a, 1861a, 219, for hæmatobium (Dist.).

hæmatobia crassa, see crassa.—1895: Bilharzia.

hæmatobia magna Kowal., 1895, see magna.—1895: Bilharzia.

hæmatobium Bilharz, 1852a, 72, t. h. Homo; Egypt.—1852: Dist. 1858: Schistosoma (type). 1858: Gynæcophorus (type). 1859: Bilharzia (type). 1860: Thecosoma (type). 1886: D. (Bilharzia). [Hæmatobium.]

hæmatobium venæ portarum Hœk or Pag., 1859, 42, for hæmatobium (Dist.).

hæmatobium hominis Dies., 1855, 63, for hæmatobium.—1855: Dist. [1895: Bilharzia.]

hæmatoma Braun, 1891d, 426, see hematoma (Dist.).

haimeanus Lacaze-Duthiers, 1854a, 294, t. h. Ostrea edulis, Cardium rusticum; Balearic Isles, Mahon, Cette.—1854: Bucephalus. 1855: B. (Bucephalopsis, type). 1856: Cerc. [Gasterost. grascilescens.]

haimejanus Erc., 1881e, 41, 87, for haimeanus (Bucephalus = Cerc.).

halecis Gmelin, 1790a, 3058, based on Leeuwenhoek, epist. 97, 47, t. h. halece.—1790: Fasc. 1803: Dist. [1809: Dist. ocreatum.]

halosauri Bell, 1887, 116, t. h. Halosaurus macrochis; Cape St. Vincent. 1887: Dist.

hamatum Rathke, 1843, 238, "for Phylline hippoglossi," on Pleuronectes hippoglossus; Europe.—1843: Trist. [1850: Phylline hippoglossi.] [1858: Epibdella hippoglossi.] [1879: Trist. hippoglossi.]

hameatobia Kowal., 1895g, 58, for hæmatobia (Bilharzia).

harengi Ben. & Hesse, 1863, 1864, 98, t. h. Clupea harengus.—1863: Octocotyle. 1879: Octobothrium. 1889: Octoplectanum.

hassalli Goto, 1895, 352, t. h. Kinosternon pennsylvanicum; Md., U. S A.—1895: Polyst.

hasta Looss, 1902m, 686, t. h. Chelone mydas; Egypt.—1902: Octangium.

haukesi Sons., 1895, 187, for hawkesii, Amphist. (Pseudodiscus).

hawkesi Braun, 1893d, 466, for hawkesii (Amphist.).

hawkesii Cobbold, 1875n, 818, t. h. Elephas indicus; India.—1875: Amphist. 1895: A. (Pseudodiscus).

helicis Meckel [? see helicis pomatiæ]. Cercariæum. [1899: Dist. leptosomum.]

helicis Leidy, 1847, 220, t. h. Helix alternata.—1847: Dist. [1855: Cercariæum helicis alternatæ.] [1858: Cercariæum vagans.]

helicis alternatæ Dies., 1855a, 389, Dist. helicis Leidy 1847 renamed.—1855: Cercariæum.

helicis asperæ Dies., 1850a, 302, t. h. Helix aspera, based on Duj., 1845a, 472.—1850: Heterost. 1850: Dist. 1855: Cercariæum.

helicis aspersæ Dies., 1855a, 398, for helicis asperæ.—1855: Heterost. 1855: Cercariæum. 1856: Cerc.

helicis carthusianellæ Par., 1894, 164, t. h. Helix carthusianella; Bologna.—1894: Cerc.

helicis maculosæ Par., 1894, 164, t. h. Helix maculosa; Bologna.—1894: Cerc.

helicis pomatiæ Dies., 1850a, 303, based on Meckel, 1846, 5, t. h. Helix pomatia.—1850: Heterost. 1850: Dist. 1855: Cercariæum.

helicis viviparæ Dies., 1850a, 298, t. h. Paludina vivipara; Vilnæ.—1850: Cerc.

helluo Mueller, 1774, 64.—1774: Fasc. 1787: Planaria.

helostomatis MacCallum, 1905, 673, t. h. Helostoma temmincki; Palembang, Sumatra.—1905: Cladorchis.

heluans Braun, 1899g, 490, t. h. Ardea cœrulea, Nycticorax gardeni; Rio de Janeiro.—1899: Clinost.

hematoma Semprum, 1890, 596, in Homo; Cuba.—1890: Dist.

hemicyclum Mol., 1859, 829, t. h. Belone acus; Batavii.—1859: Dist. 1886: D. (Echinost.).

hendorffii Lint., 1889, 163, t. h. Coryphæna hippurus; Caleta buena, Chile.—1889: Phylline. 1894: Epibdella. 1902: E. (Phylline). 1903: E. (Benedenia).

hendorfi Mont., 1902, 144, for hendorffii (Epibdella).

hepatica Rœderer, 1762, 537, see Fasc. muris.

hepatica Linn., 1758a, 648, t. h. Ovis aries; Europe.—1758: Fasc. (type). ——: Dist. (type). 1836: Dyst. 1845: Dist. (Cladocœlium, type). 1845: Fasciolaria. 1863: Dist. (Fasc.). 1892: Cladocœlium (type).

hepatica angusta Rail., 1895, 338, t. h. cattle; St. Louis, Senegal, Africa.—1895: Fasc. 1898: Dist.

hepatica apri Gmelin, 1790a, 3054, based on Le Clerc, 1715a, 119; t. h. Sus scrofa.—1790: Fasc.

hepatica boum Gmelin, 1790a, 3054, t. h. Bos taurus; Europe.—1790: Fasc.

hepatica caviæ Sons., 1896, 112, t. h. Cavia.—1896: Fasc.

hepatica cervi Gmelin, 1790a, 3054, t. h. Cervus.—1790: Fasc.

hepatica equi Gmelin, 1790a, 3054, t. h. Equus caballus.—1790: Fasc.

hepatica ovata plana Buchholzii Jœrdens, 1802, 64.—1802: Fasc. [Dicrocœlium lanceatum.]

hepatica porcorum Gmelin, 1790a, 3054, t. h. Sus scrofa dom.; Europe.—1790: Fasc.

hepaticum Betegh, in Gomy, 1898, 328, for "amphistome hépatique" = A. explanatum.—1898: Amphist.

hepaticum ægyptiaca Looss, 1896b, 33, t. h. buffles, bœufs, moutons; Egypt.—1896: Dist. 1898: Fasc.

hepaticum (perniciosum) Taylor, 1884, 52, see hepatis perniciosum.—1884: Dist.

hepaticum suis Willach, 1893, 40, t. h. Sus scrofa dom.—1893: Monost. [1894: Cysticercus tenuicollis.]

hepatis endemicum Baelz, 1883, 234, t. h. Homo; Japan.—1883: Dist. [1907: Clonorchis.]

hepatis innocuum Cæes, 1888a, 41, for h. innocuum (Dist.).

hepatis innocuum Baelz, 1883, 236, t. h. Homo; Japan.—1883: Dist. [1907: Clonorchis sinensis.]

hepatis perniciosum Baelz, 1883, 234, t. h. Homo; Japan.—1883: Dist. [1907: Clonorchis endemicum.]

hepatium Rivolta, 1884, 27, for hepaticum (Dist.).

herdmani Shipley & Hornell, 1904, 78, t. h. Margaritifera vulgaris; Ceylon.—1904: Musalia (type).

heteracanthus Massa, 1903, see heterachanthus (Trochopus).

heterachanthus Massa, 1903, 252, t. h. Trigla corax.—1903: Trochopus.

heterobranchi Wedl, 1861, 478, t. h. Heterobranchus anguillaris; Egypt.—1861: Monocerca, type.

heterocerca Goto, 1894a, 197, t. h. Seriola quinqueradiata; Hiroshima (Ujina Port), Mitsugahama, and Mitsaki, Japan.—1894: Axine.

heteroclitum Mol., 1859, 289, t. h. Perdix coturnix; Batavii.—1859: Dist. 1892: Mesogonimus. 1899: Clinost.

heterocotyle Ben., 1870, 67, t. h. Clupea sprattus.—1870: Octost. 1879: Octobothrium. 1885: Octoplectanum.

heterolecithodes Braun, 1899, 3, t. h. Porphyrio porphyrio; Madagascar, Africa.—1899: Dist. 1899: Athesmia (type).

heteromorphum Crep., 1837a, 317, t. h. Trigonocephalus sp.—1837: Dist.

heterophies Perroncito, 1879, 6, for heterophyes (Dist.).

heterophyes Sieb., 1853, 62, t. h. Homo; Egypt.—1853: Dist. 1866: [Heterophyes, type.] 1858: Dicrocœlium. 1860: Fasc. 1890: Mesogonimus. 1899: Cœnogonimus (type). 1899: Cotylogonimus (type). 1900: Heterophyes (type).

heterophyes hominis Dies., 1855, 64, for heterophyes.—1855: Dist.

heteroporum Duj., 1845a, 402, t. h. Vespertilio pipistrellus; Rennes.—1845: Dist. (Brachycœlium). 1899: Pycnoporus (type). 1899: Lecithodendrium.

heterostomum Rud., 1809a, 50, t. h. Ardea purpurea; t. l. apparently Europe.—1809: Dist. 1845: Dist. (Dicrocœlium). 1899: Clinost. 1899: Dicrocœlium.

heurteli Poir., 1885, 9, t. h. Thynnus vulgaris.—1885: Dist.

hexacantha Par. & Perugia, 1889, 740, t. h. Serranus gigas; Genova.—1889: Placunella. 1906: Trochopus.

hians Rud., 1809a, 359, t. h. Ardea nigra; Greifswald.—1809: Dist. 1845: Dist. (Dicrocœlium). 1899: Cathæmasia (type).

hiatulæ Goto, 1899a, 281, t. h. Hiatula onitis; Newport, R. I.—1899: Microcotyle.

hillii Johnston, 1904, 110, t. h. Larus novæ hollandiæ.—1904: Holost.

himantopodis Rud., 1819a, 87, t. h. Charadrius himantopus; Cat. Mus. Vien.—1819: Monost.

hippocrepis Dies., 1850a, 324, t. h. Hydrochœrus capybara; Brazil. 1850: Monost.

hippoglossi Oken, see Tasch., 1878, 568.—1878: Trist. 1879: (Epibdella). 1899: Phyllonella.

hippoglossi pleuronectes Mont., 1889, 117 (Epibdella) see Trist. uncinatum.

hippoglossi Mueller, 1776a, 220 t. h. Hippoglossus; Denmark.—1776: Hirudo. 1815: Phylline (type?). 1828: Epibdella (type). 1878: Nitzschia. 1899: Phyllonella. 1905: Phyllonella (Epidella). [Entobdella.]

hippoglossii Ben., 1858a, 1861a, 21 for hippoglossi Mueller, 1776.—1858: Epibdella. 1858: Nitzschia. 1858: Nitchia. [1878: Trist.]

hippopodii Vogt, 1854, 97, t. h. Hippopodius leteus; Quoy et Gaimard, Mediterranean.—1854: Dist.

hirndinis Brand., 1888a, 13, for hirudinis (Dist.).

hirsutum Loos, 1896b, 68, t. h. caméléon; Alexandria, Egypt.—1896: Dist. 1899: Lecithodendrium.

hirta Mueller, 1786, 128, in aqua marina bis tantum.—1786: Cerc. 1827: Coleps, type.

hirudinaceum Bartels, 1834, 61, t. h. Salmo lavaretus; St. Petersburg.—1834: Octobothrium. 1845: Octobothrium (Cyclocotyle). [1850: Discocotyle.] 1858: Placoplectanum (Discocotyle).

hirudinis Mont., 1888, 10, for hirundinis (Echinella).

hirudinis Henle, see Dies, 1850a, 418, t. h. Hirudo vulgaris.—1850: Dist. [1850: Hepast. hirudinum.]

hirundinum Zed., 1800a, xvii, 163, for hirundinis Frœlich.—1800: Dist. [1850: D. maculosum.] [1902: Plagiorchis maculosus].

hirudinum Schomburgk, 1844, 136, includes hirudinis, t. h. Nephelis vulgaris, Clepsine complanatum.—1844: Heptost. (type). [Heptast.]

hirudo Dies., 1836d, 238, t. h. Palamedea cornuta; Engenho do Cap Gama, Brazil.—1836: Amphist.

hirudo Johnston, 1846a, 437.—Planaria.

hirundinaceum Dies., 1850a, 424, for hirudinaceum (Discocotyle).

hirundinis Frœlich, 1791, 75, t. h. Thurmschwalbe.—1791: Fasc. 1800: Dist.

hirundinis Ben. & Hesse, 1863, 1864, 94, t. h. Trigla hirundo.—1863: Echinella (type). 1878: Udonella.

hispida ventriculi accipenseris sturionis Viborg, 1795, 243; see hispidum.—1795: Dist.

hispidum Abildg. in Rud., 1819a, 118, 423, t. h. Accipenser sturio; Arimini, Berlin.—1819: Dist. (Echinost.). 1858: Echinost. 1902: Deropristis (type).

histiophori Bell, 1891a, 534, t. h., Histiophorus brevirostris.—1891: Trist. [1899: T. læve.]

histrionella Ehrenberg.——Cerc.

histrix Dies., 1850a, 393, for hystrix (Dist.) Duj., 1845.—1850: Dist. 1904: Stephanochasmus.

histrix Mol., 1858, 128, t. h. Pelophylax esculentus; Patavii.—1858: Monost.

hæmatobia Bourel-Roncière, 1878a, 116, for hæmatobia (Bilharzia).

holostomoides Mehlis in Crep., 1846, 148, t. h. Colymbus cristatus.—1846: Monost. 1904: Taphrogonimus, type.

holostomum Rud., 1819a, 94, t. h. Rallus aquaticus; Vien. Mus.—1819: Dist. 1892: Cladocœlium. [1902: Urogonimus macrostomus.]

homoeostomum Dies., 1858, 343, based on Bellingham, 1844, 428, t. h. Trigla (Pini) cuculus; Ireland.—1858: Dist.

hominis Lewis & McConnell, 1876, 182, t. h. Homo; Calcutta, India.—1876: Amphist. 1895: A. (Gastrodiscus). 1896: Gastrodiscus.

hominis Dies., 1855, 63.—1855: Dist. hæmatobium.

hominis Dies., 1855, 64—1855: Dist. heterophyes.

hominis Taylor, 1884, 44, see sub Distomata.

homolostomum Linst., 1887, 104, t. h. Limnæa stagnalis.—1887: Dist.

horridum Leidy, 1850, 303, t. h. Boa constrictor.—1850: Dist. 1895: D. (Dicrocœlium). 1899: Plagiorchis.

horridus Dies., 1850a, 400, t. h. Didelphys myosurus, D. philander; Brazil.—1850: Rhopalophorus. 1898: Rhopalias.

hospes Looss, 1907, 478, t. h. cattle; Cairo, Egypt, from Soudan.—1907: Dicrocœlium.

hospitale Staff., 1900, 403, t. h. Diemyctylus viridescens.—1900: Dist. 1902: D. (Brachycœlium). 1902: Brachycœlium.

humana Gmelin, 1790a, 3053, t. h. Homo.—1790: Fasc.

hyalinum Rud., 1809a, 389, eriocis renamed, t. h. Salmo eriox.—1809: Dist.

hyalinum Schlotthauber, 1860, 129, t. h. Machetes pugnax.—1860: Monost.

hyalocauda Haldeman (1840a).—Cerc.

hyans Moul., 1856a, 49, for hians (Dist.).

hyatinum Kroyer, 1843–45a, 624, for hyalinum (Dist.).

hylæ Rud., 1819a, 121, t. h. Hyla arborea.—1819: Dist. [1850: D. cygnoides.]

hymenocerca Villot, 1875, 479, t. h. Calyptræa sinensis; Roscoff.—1875: Cerc.

hystrix Duj., 1845a, 433, t. h. Pleuronectes maximus, P. platessa.—1845: Dist. (Echinost.). 1899: Anoiktost. 1899: Stephanost. 1904: Stephanochasmus.

hystrix Duj. of Olss.—1899: Stephanost.

hystrix Brand., 1892, 506, for histrix, t. h. Rana esculenta.—1892: Monost.

hyterophytes Cobbold, 1883, 401, for heterophyes (Dist.).

idi Rud., 1819a, 87, t. h. Cyprinus idus; Cat. Ent. Vienn.—1819: Monost. (?Hypost.). 1819: Monost. [1850: Aspidogaster limacoides.]

ignorata Raspail, 1902, 119.—1902: Planaria.

ignotum Nicoll, 1906, 514, t. h. Hæmatopus ostralegus.—1906: Monost.

ijimæ Goto, 1894a, 230, t. h. Trygon pastinaca; Japan.—1894: Monocotyle.

illatabile Braun, 1901g, 897, t. h. Falco nitidus; Brazil.—1901: Scaphiost. (type).

illense Ziegler, 1883, 543, t. h. Esox lucius, Leuciscus erythrophthalmus; Strassburg.—1883: Gasterost.

illiciens Braun, 1901g, 944, t. h. Rhamphastus sp., Pipra rupicola; Brazil.—1901: Dicrocœlium.

[*illotum* Sluiter, 1898 (Dist.), a tunicate.]

imbricata Looss, 1893a, 20, t. h. Paludina vivipara La.; near Leipzig.—1893: Cerc. [1902: Notocotyle verrucosa.]

imbutiforme Mol., 1859, 844, t. h. Labrax lupus; Batavii.—1859: Dist. 1886: D. (Echinost.). 1898: Echinost. 1899: Anoiktost. 1901: Acanthochasmus.

imitans Muehl., 1898a, 17, t. h. Abramis brama; Kœnigsberg i. Pr.—1898: Dist. 1899: Asymphylodora.

imparispine Lint., 1905, 327, t. h. Rachycentron canadus; Beaufort, N. C.—1905: Dist.

impleta Looss, 1899b, 590, t. h. Tetrodon fahaka; Cairo, Egypt.—1899: Astia. 1904: Astiotrema.

impudens Crep., 1846, 149, t. h. Squalus griseus.—1846: Monost.

incerta Cobbold, 1885g, 177, t. h. Coluber; Rio Plata.—1885: Dist.

incistidata Perroncito, 1880, July, 454, t. h. Rana esculenta.—1880: Cerc.

[*incistidata* Erc., 1881, 96.—1881: Dist.]

incisum Rud., 1809a, 361, anarrhichæ lupi renamed.—1809: Dist. 1904: Fellodist. (type).

incivile Leidy, 1856b, 44, t. h. Leiostomus obliquus.—1856: Dist.

inclusum Polonio, 1859, see Par., 1894, 149, t. h. Triton punctatus; Padova.—1859: Dist.

incommodum Leidy, 1856b, 43, t. h. Alligator mississippiensis; Florida.—1856: Monost. 1891: Dist.

incomptum Stoss., 1886, 51, misprint for incomtum 1819 (Dist.).

incomtum Rud., 1819a, 683, t. h. Chætodon sp.; Brazil.—1819: Dist.

inconstans Lint., 1905, 327, t. h. Chætoditperus faber; Beaufort, N. C.—1905: Dist.

incrassatum Dies., 1850a, 390, t. h. Lutra solitaria; Brazil.—1850: Dist. 1860: Echinost. 1892: D. (Echinost.).

increscens Olss., 1868, 36, t. h. Scomber, Merlucius, Hippoglossus.—1868: Dist. 1886: D. (Echinost.). [1905: Lepodora rachiæa, type.]

indicum Montgomery, 1906, 139, t. h. donkey; India.—1906: Schistosoma.

inerme Nitzsch, MS., in Rud., 1819a, 375, t. h. Anas boschas fera.—1819: Dist. [1850: D. oxycephalum.]

inerme Fil., 1857c, pl. 2, for D. inerme paludinæ impuræ.—1857: Dist.

inerme Linst., 1879, 183, t. h. Petromyzon fluviatilis.—1879: Dist.

inerme Fuhrmann, 1904, 63, t. h. Lutra.—1904: Echinost.

inerme Par. & Perugia, 1889, 747, t. h. Corvina nigra; Genova.—1889: Calceost.

inerme paludinæ impuræ Fil., 1857c, pl. 2.—1857: Dist.

inflatum Crep., 1849, 64, t. h. Alauda arvensis.—1849: Dist.

inflatum Mol., 1859, 826, t. h. Anguilla vulgaris; Batavii.—1859: Dist. 1886: D. (Echinost.). 1898: Echinost. 1899: Anoiktost. 1902: Deropristis.

inflexa Rud., 1802b, 82, t. h. Cyprinus jeses.—1802: Fasc. 1809: Dist.

ingens Moniez, 1886, 531, t. h. unknown.—1886: Dist. 1902: Hirudinella.

inhærens Dalyell, 1853a, 262, t. h. ling.—1853: Octodactylus (type). [1864: Pterocotyle palmata.] [1879: Octobothrium palmatum.]

innocuum Baelz of Taylor, 1884, 53, for D. hepatis innocuum.—1884: Dist. [1907: Clonorchis sinensis.]

innocuum hepatis La Clinica de Malaga, 1883, 309, for D. hepatis innocuum. 1883: Dist.

inocuum Laspeyres, 1904a, 6, for innocuum (Dist.).

inops Looss, 1902n, 887, t. h. Pelecanus onocrotalus, Milvus ægyptius; Egypt.—1902: Heterophyes.

inquieta Mueller, 1786, 121, in aqua marina.—1786: Cerc. 1850: Histrionella.

inquilina Graff, 1904, 457, t. h. snails.—1904: Planaria.

insigne Dies., 1850a, 347, D. scimna Risso, 1826, renamed, t. h. Echinorhinus spinosus.—1850: Dist. [1899: D. veliporum.]

insignis Looss, 1899b, 596, t. h. Fulica atra; Egypt.—1899: Urogonimus.

insignis Graff, 1904, 457, t. h. snails.—1904: Planaria.

insignis Leidy, 1858, 18, t. h. Anadonta fluviatilis, A. lacustris.—1858: Cotylaspis (type). 1893: Aspidogaster.

instabile Duj., 1845a, 412, t. h. Sorex fodiens; Rennes.—1845: Dist. (Brachylaimus).

instar Looss, 1901, 562, t. h. Thalassochelys corticata.—1901: Enodiotrema.

integerrima Frœlich, 1791a, 104, t. h. unknown.—1791: Linguatula. 1808: Polyst. (type). 1809: Polyst. (Hexast., type.) 1828: Hexathyridium. 1828: Hexathiridium.

integerrinum Ben. & Hesse, 1864, 84, for integerrimum (Polyst.).

integrum Dies., 1850a, 429, MS.—1850: Trist. [1850: Trist. coccineum.]

intermedium Mehlis in Creplin, 1846, 138, t. h. Colymbus cristatus, C. subcristatus.—1846: Dist.

intermedium Johnston, 1904, 109, t. h. Cygnus atratus.—1904: Hemist.

intermedius Uličný, 1878, 211, t. h. Anodonta cellensis.—1878: Bucephalus.

interruptum Mont., 1891, 101, t. h. Thynnus brachypterus.; Naples.—1891: Trist.

interruptus Braun, 1901g. 897, t. h. Alcedo viridirufa, Ardea virescens; Brazil.—1901: Opisthorchis.

intersectus Lænnec, 1812c, 9, t. h. Homo; Europe.—1812: Distomus (type).

intestinale Rud., 1819a, 119, see Dist. aluconis intestinale.

intestinale Tayler, see Carter, 1862a, xxxi, t. h. Homo; District of Dacca, India.—1862: Dist.

intestinalis Mueller.— ——: Planaria.

intestinalis Linnæus, 1758a, 649, in intestinis piscium.—1758: Fasc. [Ligula.]

intestinalis Gueldenstadt, teste Rud., 1810a, 24, t. h. Sorex moschatus.—Fasc. [1810: Ligula.] [1850: Cephalocotyleum.]

intestinalis ardeæ nigræ Viborg, 1795, 242.—1795: Dist.

intestinalis testudinis mydæ Viborg, see Rud., 1809a, 433.—Dist. [1809: Dist. testudinis mydæ.]

intestinalis vulpis Viborg, 1795, 242.—1795: Dist.

invaginatum Mayer, 1841, 17, D. appendiculatum, renamed.—1841: Dist.

inversus Looss, 1907, 486, t. h. Vesperugo kuhli; Cairo, Egypt.—1907: Pycnoporus.

involutum Rud., 1809a, 377, t. h. Upupa epops; includes Fasc. upupæ Schrank, 1790, and D. fusiforme from Upupa epops.—1809: Dist.

irroratum Rud., 1819a, 105, t. h. Testudo mydas; Arimini.—1819: Dist. [1899: Astia.] 1902: Pachypsolus (type).

isabellinum Ratzel, 1868, 153, t. h. Gadus æglefinus.—1868: Monost. [1878: Rhipidocotyle gracilescens.]

ischnum Leidy, 1890, 415, t. h. Saurus fœtens, at Beach Haven, N. J.—1890: Dist.

ishikawæ Goto, 1894a, 234, t. h. Lethrinus sp.: at Hagi, Japan.—1894: Epibdella. 1903: E. (Benedenia).

ishikawai St. Remy, 1898, 532, for ishikawæ (Epibdella).

isopori Looss, 1894a, 55, in Cyclas rivicola.—1894: Cerc. [Dist. isoporum.]

isoporum Looss, 1894, 49, t. h. Cyprinus carpio, Phoxinus lævis, Leuciscus rutilus, Abramis brama, Squalius cephalus, Tinca vulgaris, Esox lucius; Germany.—1894: Dist. 1899: Creadium (type). 1900: Allocreadium (type).

isoporum armatum MacCallum, 1895, 401, t. h. Aplodmotus grunniens; North America. 1895: Dist. [Creadium.]

isostomum Rud., 1819a, 105, t. h. Astacus fluviatilis.—1819: Dist.

isostomum Rud., 1814a, 100, Amphist. anatis tadornæ and S. candida renamed, t. h. Anas tadorna; Copenhagen.—1814: Amphist. 1845: Holost. [1850: H. erraticum.]

italicum Stoss., 1893, (6), t. h. Lichia amia; Triest.—1893: Dist.

jacksoni, see jacksonii (Fasc.).—1892: Dist. 1899: Fasciolopsis.

jacksonii Cobbold, 1869, 48, t. h. Elephas indicus.—1869: Fasc. 1892: Dist.

janus Kowal., 1898, 73 or 130, t. h. Anas boschas dom.—1898: O. crassiuscula var. 1898: Opisthorchis. 1898: Campula.

japonicum Katsurada, 1904, 147, t. h. Felis catus dom., Homo; Japan.—1904: Schistosomum. 1905: Schistosoma.

japonicum Bl., 1888a, 596, t. h. Homo; D. hepatis endemicum renamed, see endemicum.—1888: Dist. [1907: Clonorchis endemicus.]

japonicus Braun, 1901, 17, in hen's egg; Yedo, Japan.—1901: Prosthogonimus.

[*jardinii* (Bucephalus), reptile.]

jesis Gmelin, 1790a, 3058, t. h. Cyprinus jeses; Europe.—1790: Fasc.

jheringhii Mont., 1899, 79, for jheringii (Temnocephala).

jheringii Haswell, 1893e, 96, t. h. Ampullaria; Brazil.—1893: Temnocephala.

kampanulatum Schneidemuehl, 1896, 302, for campanulatum.—1896: Dist.

kantaniana, see cantaniana.

kölikerii Cobbold, 1860a, 30, pelagiæ Kölliker, renamed.—1860: Dist.

köllikerii Mont., 1893, 122, for kölikerii (Dist.).

kommutatum Schneidemuehl, 1896, 303, for commutatum Dies., q. v. (Dist.).

kongenitum Schneidemuehl, 1896, 302, for conjunctum (Dist.).

konica for conica.

konikum Schneidemuehl, 1896, 303, for conicum (Amphist.).

kowalewski Rail., 1899, 788, for kowalewskii (Schistosoma).—1902: Bilharzia.

kowalewskii Par. & Ariola (1896), 114, t. h. Larus melanocephalus.—1896: Bilharzia. 1899: Schistosoma. 1899: Bilharziella.

krassum Schneidemuehl, 1896, 302, for crassum (Dist.).

krœyeri Leuck., 1847, 147, t. h. Caligus sp. on Gadus sp.—1847: Amphibothrium (type).

kröyeri Wierezejski, 1877, 550, for kroyeri (Calicotyle).

krœyeri Hœk, 1856a, 507, for kroyeri (Calicotyle).

krayerii Ben., 1870, 16, for kroyeri (Callicotyle).

krohnii Kœlliker, 1849d, 65, t. h. a cephalopod.—1849: Dyst. [Dist.]

kroyeri Dies., 1850a, 431, t. h. Raja radiata; Kattegat.—1850: Calicotyle (type). 1858: Callicotyle. 1898: Calycotyle.

kroyeri Dies., 1850a, 427, for krœyeri (Amphibothrium).

kuhni Cobbold, 1860a, 39, M. leporis, renamed, t. h. Lepus cuniculus—1860: Monost. [Cysticercus pisiformis.]

kuneatum Schneidemuehl, 1896, 303, for cuneatum (Dist.).

labiatum Rud., 1819a, 108, t. h. Syngnathus pelagicus; Naples.—1819: Dist.

labii Linst., 1889, 79, misprint for labri Stoss. (Dist.).

labracis Duj., 1845a, 398, t. h. Labrax lupus; Rennes.—1845: Dist. (Dicrocœlium). 1870: Echinost. 1870: D. (Echinost.). 1899: Dicrocœlium. 1901: Allocreadium.

labracis Cerf., 1895, 125, t. h. Labrax lupus; White Bank, N. Sea.—1895: Diclidophora.

labracis Ben. & Hesse, 1863, 1864, 112, t. h. Labrax lupus.—1863: Microcotyle (? type).

labri Rud., 1819a, 122, t. h. Labrus rupestris; C. E. V.—1819: Dist. [1850: D. fasciatum.]

labri Ben., 1870, 45, n. sp., t. h. Labrus maculatus.—1870: Dist.

labri Stoss., 1886, 30, t. h. Labrus mixtus; locality not given.—1886: Dist. 1886: D. (Dicrocœlium). 1901: Allocreadium. 1902: Loborchis.

labri rupestris Olss., 1876, 20.—1876: Dist. 1886: D. (Apoblema). 1891: Apoblema.

lacertæ Dies., 1850a, 331, t. h. Lacerta agilis.—1850: Monost. [Cf. Piestocystis dithyridium.]

lacertæ Rud., 1819a, 121, t. h. Lacerta cærulescens; C. E. V.—1819: Dist. [1850: D. mentulatum.]

lachrymosus Braun, 1902b, 31, t. h. Larus maculipennis; Brazil.—1902: Philophthalmus.

laciniatum [Blainv., 1824] Duj. 1845a, 437, t. h. Simia maimon; Paris.—1845: Dist. [1824: "Alaire" type.] [1850: Alaria Blainv., type.]

laciniatum Mol., 1859, 821, apparently lapsus for fimbriatum.—1859: Gasterost.

lacrhyma Bory de St. Vincent, 1823a, 354, in infusions d'orge et d'avoine.—1823: Cerc.

lactea Mueller, 1774, 61, free form.—1774: Fasc. 1787: Planaria.

lacteum Jægers., 1896, 167, t. h. Cottus scorpius.—1896: Monost. 1899: Galactosomum (type).

læve Lint. 1898, 517, t. h. Macrourus bairdii.—1898: Dist. 1899: Hemiurus.

læve Verrill, 1875, 40, t. h. Tetrapturus albidus; North America.—1875: Trist. [1906: T. ovale.]

laeve var. *armata* Goto, 1899a, 273, for læve Verrill and histiophori of Bell.—1899: Trist.

læve var. *inermis* Goto, 1899a, 273, ovale renamed.—1899: Trist. [1899: T. ovale.]

lævis Ben. & Hesse, 1864a, 87, t. h. Mustelus lævis.—1864: Erpocotyle (type).

lagena Rud., 1809a, 366, as Distomate lagena, see lagena 1788.

lagena Braun, 1788, 237, t. h. Perca fluviatilis; Europe.—1788: Planaria. 1790: Fasc. 1809: Dist. [1809: Dist. nodulosum.]

lagena Mol., 1858, 127, t. h. Strix passerina; Patavii.—1858: Holost.

lagena Brand., 1888, 249, ascidia Ben., 1873, not Rud., 1819, renamed.—1888: Dist. 1899: Lecithodendrium (type).

lageniforme Lint., 1898, 524, t. h. Remora remora.—1898: Dist.

lambitans Braun, 1899g, 490, t. h. a "Reiher;" Semanabay, West Indies.—1899: Clinost.

lampetræ Gulliver, 1872, 103, t. h. Planer's lamprey; Canterbury.—1872: Neuronaia.

lampridis Lœnnberg, 1891, 73, t. h. Lampris guttatus; Kristiania Mus.—1891: Didymozoon.

lancea Dies., 1850a, 334, t. h. Delphinus tacuschi; Barra do Rio Negro, Brazil.—1850: Dist. 1892: D. (Dicrocœlium). 1901: Opisthorchis.

lanceatum Stiles & Hass., 1896, 158, lanceolatum Rud., 1803 [not Schrank, 1790] renamed.—1896: Dicrocœlium (type). 1899: Dist.

lanceolata Schrank, 1790, 123, t. h. Cyprinus brama.—1790: Fasc.

lanceolata Schulze in Zeringer (1829), see Crep., 1839a, 291.—?(1829): Cyclocotyla. (1839): Cyclocotyle. [1850: Discocotyle sagittata.] [1879: Octobothrium sagittatum.]

lanceolata Rud., 1803, 24, t. h. Homo; Europe.—1803: Fasc. 1825: Dist. 1845: D. (Dicrocœlium, type). 1856: Dicrocœlium.

lanceolatum F. S. Leuck., 1827a, 24, t. h. Clupea alosa; Germany.—1827: Octobothrium (type). 1850: Octocotyle (type). 1858: Octoplectanum (type). [Mazocraes alosæ.] [Octostoma alosæ.]

lanceolatum Wedl, 1858, 251, t. h. Himantopus rubropterus.—1858: Monost. 1902: Hæmatotrephus (type).

lanceolatus alosæ Mayer, 1841, 23, Octobothrium lanceolatum, renamed.—1841: Decacotylus.

lanceolum Gronkowski, 1902a, 519, for lanceolatum (Dist.).

lanceulatum Baldi, 1900a, 224, for lanceolatum (Dist.).

lapridis Sars, teste Nordmann, 1840, 600, in Lampris gullatus.—1840: Hexacotyle.

lari glauci Rud., 1819a, 92, t. h. Larus glaucus; Cat. Ent. Vien.—1819: Amphist. [1850: Hemist. spathaceum.]

lasium Leidy, 1891a, 415, t. h. Ilyanassa obsoleta; Beach Haven, N. J.—1891: Dist.

lata Lespés, 1857, 114, t. h. Venus decussata; Arcachon.—1857: Cerc. 1858: C. (Gymnocephala).

lateralis Looss, 1902h, 138, t. h. Mugil auratus, M. chelo.—1902: Haploporus.

laticolle Rud., 1819a, 117, t. h. Caranx trachurus; Naples and Arimini.—1819: Dist. (Echinost.) 1899: Tergestia. 1899: Echinost.

laticolle Much., 1896, 590 [not Rud., 1819], t. h. Anas glacialis; apparently Kœnigsberg i. Pr. See platyurum.—1896: Dist.

latiuscula Gœze, 1782a, 169, includes Fasc. hepatica Linn.—1782: Planaria.

laureatum Zed., 1800a, 164, t. h. Salmo trutta; Europe.—1800: Dist. 1802: Fasc. 1828: Lobostome, type. 1845: Dist. (Crossodera). 1860: Crossodera. 1900: Crepidost. - - : Bunodera.

[*laysani* Sluiter, 1900, 9 (Dist.) a tunicate.]

[*leachii* Stevens, 1827 (Distomus), beetle.]

lecithonotus Luehe, 1900, 555 [see philodryadum], t. h. Coluber sp., C. eririo, Philodryas schotti; Brazil.—1900: Opisthogonimus (type).

leidyi Cobbold, 1860a, 10, Clinost. dubium Leidy, renamed.—1860: Dist.

lemna Mueller, 1773, 67, in aquis paludosis.—1773: Cerc. (?type). 1850: Histrionella.

lenoiri Poir., (1885) 1886, 3, t. h. Tetrathyra vaillantii; Senegal.—1885: Cephalogonimus (type).

lenoiri Poir., 1886, 20 t. h. Tetrathyra vaillantii; Senegal.—1886: Aspidogaster. 1892: Platyaspis (type). 1902: Cotylaspis.

lenoirii Mont., 1888a, 16, for lenoiri (Aspidogaster).

lenticola Linst., 1878, 226, t. h. Abramis vimba.—1878: Diplost. 1892: Tetracotyle.

lentis Gescheidt, 1833, 421, t. h. Homo.—1833: Monost. 1860: Festuc. 1892: Monostomulum. 1894: Dist.

lepidotus Looss, 1907, 481, t. h. Vesperugo kuhli; Cairo, Egypt.—1907: Parabascus (type).

leporis Kuhn, 1829, 464, t. h. Lepus cuniculus.—1829: Monost. [Cysticercus pisiformis.]

leptogaster F. S. Leuck., 1830a, 612, t. h. Chimæra monstrosa; Europe.—1830: Octobothrium. 1845: Octobothrium (Cyclocotyle). 1850: Discocotyle. 1858: Placoplectanum (Discocotyle). 1890: Octocotyle (Octobothrium).

leptosoma Villot, 1878, 32, cercarian stage of Dist. leptosomum, in Scrobicularia tenuis.—1878: Cerc.

leptosomum Crep., 1829, 57, t. h. Tringa variabilis.—1829: Dist. 1845: D. (Echinost.). 1860: Echinost.

leptostomum Olss., 1876, 18, t. h. Meles taxus.—1876: Dist. 1892: D. (Brachylaimus) 1899: Harmost. (type). 1899: Heterolope (type).

leucochloridii Leuck., 1858a, 114, see Leucochloridium paradoxum.—1858: Cerc. 1858: Dist.

levinseni Odhn., 1905, 348, t. h. Gadus saida; East Greenland.—1905: Hemiurus.

levinseni Setti, 1898, 311, for levinsenii (Trist.).

levinsenii Mont., 1891, 101 t. h. Thynnus sp.—1891: Trist.

lichiæ Ariola, 1899, 1, t. h. Lichia amia; Genova.—1899: Microcotyle.

lidiæ Par., 1902, 6, for lydiæ (Echinost.).

ligula Ben., 1870, 1871a, 17, t. h. Scymnodon ringens; Portugal.—1870: Dist.

liguloideum Dies., 1850a, 320, t. h. Vastres cuvieri; Borbæ, Brazil.—1850: Monost. 1892: Amphilina.

liliputanum Looss, 1896, 141, t. h. Pernis apivorus, at Alexandria, Egypt; Milvus parasiticus, at Matarijeh.—1896: Echinost.

lima Rud., 1809a, 408, t. h. Vespertilio auritus, V. murinus; Europe.—1809: Dist. (Echinost.). 1892: D. (Brachylaimus). 1899: Plagiorchis (type). [1899: Lepoderma.]

limacis Dies., 1850a, 302, based on Duj., 1845a, 472, in Limax agrestis, L. cinerea, L. rufa; Rhedoni.—1850: Dist. 1850: Heterost. 1855: Cercariæum. 1856: Cerc. [1858: C. (Acanthocephala) trigonocerca.]

limacoides Dies., 1834a, 1231; 1835c, 421, t. h. Cyprinus dobula, C. idus; Cat. Vien.—1834, 1835: Aspidogaster. 1835: Monost.

limatulum Braun, 1900f, 389, t. h. Molossus sp.; from Brazil.—1900: Dist. [1907: ? Parabascus.]

limnææ ovatæ Linst., 1885, 251.—1885: Dist.

limnææ ovatæ Linst., 1884, 142.—1884: Cerc. [1889: Dist. endolobum Duj.]

limnææ truncatulæ Linst., 1892, 331, t. h. Limnæa truncatula.—1892: Cerc.

limnæi Dies., 1850a, 302, based on Duj., 1845a, 473, t. h. Limnæus palustris; Rhedoni.—1850: Dist. 1850: Heterost.

limnæi Pag., 1857, 32, t. h. Lymnæus stagnalis.—1857: Tetracotyle. [1858: T. typica.]

limnophili Linst., 1879, 185, t. h. Limnophilus rhombicus; apparently Germany.—1879: Dist. [1889: D. endolobum.]

limuli Graff (1879), 202.—1879: Plan.

lineare Rud., 1819a, 83, t. h. Tringa vanellus; Mus. Vien.—1819: Monost. (Monost.). [1850: Notocotyle triseriale.] [1896: N. verrucosum.]

linearis Looss, 1901, 618, t. h. Chelone mydas; Egypt.—1901: Pleurogonius.

linearis Rud., 1793a, 29, t. h. Phasianus gallus; Greifswald, October.—1793: Fasc. 1803: Dist. 1860: Crossodera. 1896: Bunodera.

linearis Mueller, 1774, 67, in foveis palustribus sylvarum.—1774: Fasc. 1787: Plan.

linearis Lespés, 1857, 117, t. h. Littorina littorea.—1857: Cerc. 1858: C. (Acanthocephala).

[*linearis* (Nitzschia) a diatome.]

linearis longa Linn. teste Pallas, 1781a, 95, in Cyprinus.—1781: Fasc.

lineata Mueller, 1774, 60, in littore maris Balthici.—1774: Fasc. 1776: Plan.

lineatus Scott, 1901, 143, t. h. Trigla lineata; Clyde.—1901: Trochopus.

lincola Dies., 1850a, 346, t. h. Falco rufus; C. E. V.—1850: Dist.

lingua Bosc, 1802a, 262.—1802: Plan.

lingua Crep., 1825, 47, t. h. Larus marinus.—1825: Dist. 1892: D. (Dicrocœlium). 1899: Tocotrema (type). 1899: Cryptocotyle. 1899: Cotylogonimus (Cryptocotyle). 1903: Cryptocotyle.

linguæforme Dies., 1850a, 335, Brachylæmus erinacei Bl., 1847, renamed; t. h. Erinaceus europæus; Paris.—1850: Dist. 1898: Mesogonimus.

linguale Odhn., 1902, 66, t. h. Gymnarchus niloticus; Sudan.—1902: Phyllodist.

linguatula Rud., 1819a, 100, t. h. Rana; Brazil.—1819: Dist. ?: D. (Brachylaimus).

linguatula Looss, 1899b, 668, t. h. Chelonia mydas; Egypt.—1899: Microscapha. 1902: Microscaphidium. 1902: Polyangium (type).

linstowi Mont., 1893, 102, for linstowii (Dist.).

linstowii Stoss., 1890, 42, Monost. aculeatum Linst., from Testudo græca, renamed.—1890: Dist. 1895: D. (Dicrocœlium). 1899: Telorchis Luehe. 1899: Telorchis (type) Looss. 1900: T. (Cercorchis, type).

lintoni Pratt, in Lint., 1901b, 435, D. auriculatum Wedl of Lint., in Acipenser rubicundus, renamed.—1901: Bunodera.

liorchis Fischder., 1901, 368, t. h. Cervus simplicicornis, C. campestris, C. mexicanus, C. rufus, C. dichotomus, C. namby; Brazil.—1901: Paramphist.

littoralis Herbst, 1787a, 35.—1787: Plan.

lobatum Rail., 1900, 241, t. h. Accipiter nisus.—1900: Dicrocœlium. 1902: Lyperosomum.

lobatus Looss, 1901l, 619, t. h. Chelone mydas; Egypt.—1901: Glyphicephalus.

lobianchi Mont., 1888a, 7, t. h. Raia clavata.—1888: Acanthocotyle (type).

lobianchii Mont., 1891a, 104, for lobianchi (Acanthocotyle).

lobianchoi Goto, 1899, 285, for lobianchi (Acanthocotyle).

lobiancoi Mont., 1899, 75, for lobianchi (Acanthocotyle).

lobotes MacCallum, 1895, 406, t. h. Anguilla chrysopa, Perca flavescens, Stegostedion vitreum; North America.—1895: Dist. 1904: Centrovarium (type).

loliginis delle Chiaje, 1823, pl. 92, t. h. Loligo vulgaris; Naples.—1823: Polyst. [1850: Solenocotyle chiajei (type).]

loliginis Gmelin, 1790a, 3059, includes F. barbata.—1790: Fasc. 1803: Dist. [1850: Tetrabothriorhynchus migratorius.]

loliginis delle Chiaje, 1841a, 140.—1841: Amphyst. [Amphist.] 1894: Monost.

longe Braun, 1892a, 581, for longum (Diplost.).

longicauda Rud., 1809a, 372, t. h. Corvus cornix.—1809: Dist. [1819: D. macrourum.] 1899: Dicrocœlium. [1899: Lyperosomum.] 1902: Lyperosomum (type).

longicauda Goto, 1899a, 282, t. h. Cynoscion regale; Newport, R. I.—1899: Microcotyle.

longicaudata Piana, 1882, see Par., 1894, 161, t. h. Helix carthusiana.—1882: Cerc. [See also longocaudata.]

longicolle Crep., 1846, 154, t. h. Cottus gobio.—1846: Dist.

longicolle Crep., 1825, 57, t. h. Perca vulgaris, P. cernua; includes D. embryo Olfers.—1825: Dist. [1850: D. embryo.]

longicolle Rud., 1819a, 87, t. h. Ardea alba, A. stellaris, Larus ridibundus, L. atricilla; Mus. Vien.—1819: Amphist. 1845: Holost. 1905: Strigea.

longicollis Rud., 1809a, 380, based on Bloch, 1782a, 6, t. h. Esox lucius.—1782: Fasc. [1809: Dist. tereticolle.]

longicollis Abildg., [1788], 34, t. h. Coluber natrix.—[1788]: Fasc. 1860: Dist.

longicollis Frœlich, 1791, 73, t. h. Cyprinus carpio.—1791: Fasc. [1809: Dist. globiporum.] 1881: Dist.

longicollis Dies., 1850a, 417, Octost. merlangi Kuhn, renamed, t. h. Merlangus vulgaris.—1850: Diclidophora. 1859: Octoplectanum. [1879: Octobothrium merlangi.]

longipenis Looss, 1899, 608, t. h. ape; Ghizeh Zool. Garden.—1899: Phaneropsolus.

longipes Dies., 1850a, 428, tubiporum 1835 renamed, t. h. Trigla hirundo.—1850: Trochopus (type). [1864: T. tubiporus.]

longiplexus Staff., 1902, 901, in lungs of American frogs and toads.—1902: Hæmatolœchus. 1905: Pneumonœces.

longispina Klein, 1905, 65, t. h. Rana hexadactyla; India.—1905: Halipegus.

longissimum Linst., 1883, 308, t. h. Ardea stellaris; Turkestan.—1883: Dist. 1892: D. (Dicrocœlium). 1896: Opisthorchis .

longissimum Poir., 1886, 29, t. h. Delphinus tursio.—1886: Dist. 1892: D. (Dicrocœlium). [1896: D. tursionis.]

longissimum corvinum Stiles & Hass., 1894, 418, t. h. Corvus americanus, C. ossifragus; U. S. A.—1894: Dist. (Dicrocœlium). 1899: Opisthorchis.

longissimum eorvinum Stiles & Hass., 1896, 155, misprint for corvinum (Dist. longissimum).

longiusculns Looss, 1902m, 582, misprint for longiusculus (Pleurogonius).

longiusculus Looss, 1901l, 568, t. h. Chelone mydas; Egypt.—1901: Pleurogonius (type).

longocaudata Piana, 1882, teste Par., 1894, 622 (misprint?) in Helix carthusianella; Reggio Em.—1882 or 1894: Cerc.

longum Brand., 1888a, 25, t. h. Crocodilus; Brazil.—1888: Diplost.

longum Leidy, 1851, 206, t. h. Esox estor; at Cleveland, Ohio.—1851: Dist. 1904: Megadist. (type).

loossi Ssinitzin, 1905, 33, G. cygnoides of Looss renamed.—1906: Gordodera.

loossii Marshall & Gilbert, 1905, 483, t. h. Micropterus salmoides, Lucius lucius, Amia calva.—1905: Azygia.

lophocerca Fil., 1857c, 5, t. h. Paludina impura; Torino.—1857: Cerc. 1858: Glenocerc.

lorenzii Mont., 1899, 1045, t. h. Trigla sp.; Rovigno.—1899: Plectanocotyle.

lorum Duj., 1845a, 407, t. h. Talpa europæa; Rennes.—1845: Dist. (Brachylaimus). 1893: Mesogonimus. 1899: Dolichosomum (type). [1899: Ityogonimus (type).] 1900: Dolichodemas (type).

loxiæ Rud., 1819a, 120, t. h. Loxia chloris, L. coccothraustes, L. pyrrhula; C. E. V.—1819: Dist. [D. mesostomum.]

lubens Braun, 1901, 945, t. h. Pipra rupricola.—1901: Dicrocœlium.

lucaneum Brand., 1892b, 511, for Monost. (Glenocerc.) lucanica in Planorbis parvus.—1892: Monostomulum.

lucania Leidy, 1904a, 143, for lucanica (Monost.).

lucanica Leidy, 1877, 200, t. h. Planorbis parvus; U. S. A.—1877: Monost. (Glenocerc.). [1892: Monostomulum, see lucaneum.]

lucii Mueller, 1776, 224, t. h. Lucius, esoph., stomach.—1776: Fasc. 1782: Plan. 1800: Dist. [D. tereticolle.]

lucii Rud., 1819a, 122, for D. esocis lucii Rud., 1809a, 438, t. h. Esox lucius; Greifswald.—1819: Dist.

lucioperca Mueller, 1776, 223, t. h. Perca lucioperca.—1776: Fasc. 1803: Dist. [D. nodulosum.]

lucipetum Rud., 1819a, 94, t. h. Larus fuscus, L. glaucus; Mus. Vien.—1819: Dist. 1828: Fasc. 1845: D. (Dicrocœlium). 1899: Philophthalmus.

lühei Odhn., 1905, 351, t. h. Clupea harengus, C. sprattus.—1905: Hemiurus.

luna Mueller, 1786, 139, in aqua rarissime.—1786: Cerc. 1815: Furcocerca. 1827: Lecane.

lunatum Dies., 1836d, 238, t. h. Cervus dichotomus [?], Anas melanotus , A. ipecutiri, Himantopus wilsonii; Caiçara, Brazil.—1836: Amphist.

lunatus Looss, 1901l, 558, t. h. Thalassochelys corticata; Triest.—1901: Pachypsolus (type). [See irroratus.]

lungocaudata Piana teste R. Bl., 1888a, 603 (see also longicaudata), t. h. **Helix carthusiana.**—1888: Cerc.

lupi Ben. & Hesse, 1863, 92, t. h. Labrax lupus.—1863: Udonella.

lupus Mueller, 1773, 67, in aquosis, ubi Lemna vegetat, rara.—1773: Cerc. 1815: Furcocerca. 1827: Dicranophorus. [1828: Cyclogena (type).]

lusca Ben., 1868a, 7, for luscæ (Dactycotyle), in Morrhua lusca.

luscæ Ben. & Hesse, 1863; 1864, 111, t. h. Morrhua lusca.—1863, 1864: Dactycotyle. 1879: Dactylocotyle. 1879: Octobothrium. 1890: O. (Dactylocotyle).

lutea Ben. of Giard, 1897c, 954, t. h. Tapes decussatus and T. pullastra at Arcachon and Donax trunculus at Wimereux.—1897: Cerc. [1897: Brachycœlium luteum.]

lutea Ben., 1870, 3, t. h. Scyllium canicula.—1870: Dist. 1897: Brachycœlium. 1897: Cerc. 1904: Diphterost. [D. betencourti.]

luteum Baer, 1826a, 125; 1827, 610, t. h. Paludina vivipara; Regiomonti.—1826: Dist. [1850: Heterost. ovatum.]

luzii Dies., 1850a, 358, for lucii (Mueller) Zed., (Dist.).

lydiæ Stoss., 1896, 190, t. h. Orthagoriscus mola: Triest.—1896: Echinost. 1899: Dist. 1899: Anoiktost. 1899: Stephanost. 1901: Dihemistephanus (type).

lymnæi auricularis Fil., 1854, 25, t. h. Lymnæus auricularis.—1854: Dist. 1855: Cercariæum. 1856: Cerc.

lymnæi obscuri Erc., 1881c, 33, t. h. Limnæus obscurus, L. stagnalis; Bologna.—1881: Cerc.

lymnæi palustris Dies., 1855a, 399, for limnæi 1850a, 302.—1855: Cercariæum.

lymnæi peregri Dies., 1858d, 279, t. h. Lymnæus pereger; Turin.—1858: Cercariæum.

lymphaticum Linst., 1903, 353, t. h. Mustelus vulgaris.—1903: Dist. [1906: D. megastomum.]

lyratum Schlotthauber, 1860, 129, t. h. Ardea cinerea.—1860: Holost.

macaci Cobbold, 1861, 119, t. h. Macacus radiatus.—1861: Cerc.

macconnelli Cobbold, 1876, 97, D. sinense renamed.—1876: Dist. [1907: Clonorchis sinensis.]

macdonaldi Mont., 1891, 120, t. h. Melo sp.; Shark Bay, West Australia.—1891: Aspidogaster.

macdonaldii Mont., 1891, 121, for macdonaldi (Aspidogaster).

macorcerca Looss, 1894a, 253, for macrocerca (Cerc.).

macrobothrium Ben., 1870, 70, t. h. Osmerus eperlanus.—1870: Dist.

macrocephalum Rud., 1803a, 21, t. h. Strix bubo; includes Strigea and Fasc. strigis.—[1782: Planaria.] [1788: Festuc.] [1790: Fasc.] [1790: Strigea, type.] 1803: Amphist. (type). [1819: Holost. variabile, type.] 1828: Holost. (type). [1850: Hemist.]

macrocephalum [pars: falconis milvi] Rud., 1819a, 88.—1819: Amphist. [1840: A. striatum.] [1850: Hemist. spathula.]

macrocerca Fil., 1854a, 13, t. h. Cyclas cornea; Turin.—1854: Cerc. 1855: C. (Xiphidiocerc.) 1858: C. (Acanthocephala). [1858: Dist. cygnoides.] [1902: Gorgodera cygnoides.]

macrocotyle Dies., 1858, 342, t. h. Orthagoriscus mola, in Ireland; based on Bellingham, 1844, 429.—1858: Dist. [1860: D. macrocephalum.] 1886: D. (Cladocœlium). 1893: D. (Accacœlium). [1893: D. megnini.] 1898: Podocotyle. 1898: D. (Podocotyle). 1901: Accacœlium.

macrolaimus Linst., 1894b, 334, t. h. Vesperugo pipistrellus.—1893: Dist. 1899: Lecithodendrium.

macrophallos Linst., 1875a, 190, t. h. Totanus hypoleucos.—1875: Dist. 1892: D. (Brachycœlium.) 1900: D. (Levinsenia). 1899: Levinsenia.

macrophallus Linst., 1887, 104, for macrophallos (Dist.).

macropoculum Cobbold, 1860a, 25, macrocotyle 1858 renamed, t. h. Orthagoriscus mola.—1860: Dist.

macroporum Mont., 1893, 133, t. h. Lophius piscatorius.—1893: Dist.

macropterum Wien. MS. in Brandes, 1888a, 55, syn. of grande Dies.—1888: Hemist. [1888: Diplost. grande.]

macrorchis Brand., 1892, 508, t. h. marine turtles.—1892: Monost.

macrostoma Rud., 1803a, 26, t. h. Nachtigall [Motacilla luscinia]; Greifswald, June.—1803: Fasc. 1809: Dist. 1893: Urogonimus (type). 1896: D. (Urogonimus). [1835: Leucochloridium paradoxum, type.] 1907: Leucochloridium, type.

macrostomum Schlotthauber, 1860, 130, t. h. Petromyzon fluviatilis.—1860: Dist.

macrostomum Rud., 1809a, 337, t. h. Larus cinerarius; Greifswald.—1809: Monost. (Monost.).

macrostomum Jægers., 1900a, 33, t. h. Telmatias major; ?Upsala.—1900: Diplost.

macrourum Rud., 1819a, 98, t. h. Corvus cornix; D. longicauda Rudolphi, 1809a, 372 renamed.—1819: Dist. 1853: Dist. (Dicrocœlium). 1899: Dicrocœlium. [1902: Lyperosomum longicauda and Dicrocœlium albicolle.]

macrurum Schlotthauber, 1860, 129, t. h. Corvus glandarius.—1860: Monost.

macrurum Braun, 1892a, 746, for macrourum (Dist.).

maculata Leidy, 1847e, 252, free; Phila.—1847: Plan.

maculatum Looss, 1901d, 402, t. h. Labrus merula, Crenilabrus pavo, C. griseus; Triest.—1901: Dist.

maculatum Rud., 1819a, 123, t. h. Diodon; California.—[1811: Capsala martinieri, type.] 1819: Trist. 1840: Capsala. 1850: Trist.

maculosa Rud., 1802, 67, F. hirundinis renamed, t. h. Hirundo apus.—1802: Fasc. 1809: Dist. 1845: D. (Brachylaimus). 1892: D (Dicrocœlium). 1901: Plagiorchis.

madagascariensis Vayssière (1892), 64.—1892: Temnocephala. 1899: Dactylocephala (type).

magna Cobbold, 1859d, 364, t. h. Cercopithecus fuliginosus.—1859: Bilharzia. 1892: Gynæcophorus. [1895: Bilharzia hæmatobia.] 1899: Schistosoma.

magna Pag., 1857, 22, t. h. Paludina vivipara.—1857: Cerc. 1858: C. (Gymnocephala).

magnioratum Stoss., 1898, 53, t. h. Puffinus kuhlii; Triest.—1898: Echinost.

magnum Bassi, 1875, 497, t. h. [Hirsch]; Mandria.—1875: Dist. 1889, 1894: Fasc.

maimonis Blainv., 1828, 586, t. h. Simia maimon.—1828: Fasc.

maior Tasch., 1879, 263, for major (Dactylogyrus).

major Goto, 1894a, 203, t. h. Scomber colias; Japan.—1894: Octocotyle.

major Nitzsch, 1817, 44.—1817: Cerc. [1850: Histrionella lemna.]

major Wagener, 1857, 99, "pl. 15, fig. 9," t. h. Gobius fluviatilis.—1857: Dactylogyrus.

majus St.-Remy, 1898, 547, for major (Octocotyle).

malleus Linst., 1877, 182, t. h. Barbus fluviatilis.—1877: Dactylogyrus.

mancupatus Fischder., 1901, 371, t. h. African cattle.—1901: Gastrothylax.

mansoni Sambon, 1907, 365, t. h. Homo; Africa.—1907: Schistosomum.

marænulæ Rud., 1809a, 339, t. h. Salmo marænula; Europe.—1809: Monost. (Hypost.) 1892: Monostomulum.

marculentum Braun, 1901g, 948, t. h. Emberiza citronella; Vien. Mus.—1901: Dist.

margaritarum Dubois, 1901, 603, t. h. Mytilus edulis.—1901: Dist.

margaritiferæ Shipley & Hornell, 1904, 78, t. h. Margaritifera vulgaris; Ceylon.—1904: Muttua (type).

margaritiferæ Shipley & Hornell, 1904, 78, t. h. Margaritifera vulgaris; Cheval Paar, Ceylon.—1904: Aspidogaster.

marginatum Rud., 1819a, 680, t. h. Ardea sp.; Brazil.—1819: Dist. 1892: Mesogonimus. 1899: Clinost.

marginatum Mol., 1858, 128, t. h. Anas crecca; Batavii.—1858: Dist. 1892: D. (Brachylaimus).

marilæ Rud., 1819a, 87, t. h. Anas marila; Cat. Ent. Vien.—1819: Monost. [1850: Notocotyle triseriale.]

marillæ Dies., 1850a, 411, for marilæ (Monost.).

marina Garsin, 1730a, 387, t. h. Scomber pelamys.—1730: Hirudinella.

marionis St. Loup, 1885, 176, t. h. Mæna vulgaris.—1885: Choricotyle.

marmorosa Mueller, 1774, 71, in fossis aquaticis rara.—1774: Fasc. 1787: Plan.

marsupium Braun, 1901g, 941, t. h. Perdix rufina; Brazil.—1901: Harmost.

martinieri Bosc, 1811, 384, t. h. Diodon sp.—1811: Capsala (type).

martiranoi Stiles, 1903aa, 15, t. h. Anopheles claviger.—1903: Agamodist.

medians Olss., 1876, 25, t. h. Bufo vulgaris.—1876: Dist. 1899: Pleurogenes.

medians Olss. of Staff., 1900, Aug., 412.—1900: Dist. [1905: Loxogenes arcanum.]

medioplexus Staff., 1902, 901, t. h. American frogs and toads.—1902: Hæmatolœchus. 1905: Pneumonœces. [See Ostiolum formosum, type.]

medioximus Braun, 1901g, 895, t. h. Galbula grandis; Brazil.—1901: Eumegacetes.

medius Kath., 1894a, 129, t. h. Cobitis fossilis, Cyprinus carpio.—1894: Gyrodactylus.

megachondrus Looss, 1899b, 593, t. h. Testudo (græca?).—1899: Enodia (type). 1901: Enodiotrema (type).

megacotyla Dies., 1858d, 263, for Dist. echinatoides Pag., 1857, 32 [not Fil.], t. h. Anodonta cygnea; Heidelberg.—1858: Cerc. (Nephrocephala).

megacotyle Dies., 1850a, 379, D. velellæ Fil. renamed, t. h. Velella spirans; Naples.—1850: Dist.

megacotyle Dies., 1836d, 238, t. h. Silurus palmito; Matogrosso, Brazil.—1836: Amphist.

megacotyle Linst., 1906, 176, t. h. Histiophorus sp.; Beruwala.—1906: Trist.

megacotylea Villot, 1878, 30, t. h. Mysis.—1878: Cerc.

megalocephalum Brand., 1888a, 67, t. h. Stomias sp.; Brazil.—1888: Holost.

megalocotyle Mont., 1893, 52.—1893: Dist.

megaloon Linst., 1879, 337, t. h. Lacerta agilis.—1879: Dist.

megastomum Wagener, 1857, 57, t. h. Cyprinus blicca, C. amarus.—1857: Dactylogyrus.

megastomum Rud., 1819a, 102, t. h. Squalus galeus; Arimini.—1819: Dist. 1886: D. (Brachylaimus). 1900: Ptychogonimus (type).

megastomum Grobben, 1878a, 89, t. h. Portunus depurator.—1878: Dist.

megastomum leporis Kuhn (1829c).—1829: Dist.

megastomus Looss, 1902m, 533, t. h. Chelone mydas; Egyptian coast—1902: Cricocephalus.

megatocyle Linst., 1903, 354, misprint for megalocotyle Mont. (Dist.).

megnini J. Poir., 1885, 4, t. h. a fish.—1885: Dist. 1893: D. (Accacœlium). [1893: D. macrocotyle.]

megninii Mont., 1893, 102, for megnini 1885 (Dist.).

melanocystis Staff., 1904, 483, t. h. Lophius piscatorius; Canada.—1904: Xenodist. (type).

melanoglena Dies., 1855a, 393, Melanoglena bipunctata renamed.—1855: Histrionella. 1858: Glenocerc.

melanoglena Pag., 1862, 298.—1862: Cerc.

melanops Dies., 1855a, 400, based on Cerc. paludinæ impuræ Baer, 1827b, 655.—1855: Cercariæum. 1858: Histrionellina.

melis Schrank, 1788, 17, t. h. Dachs, Meles; Europe; Planaria teres Goeze, pro parte, renamed.—1788: Fasc. 1800: Dist. 1809: Plan. [1850: D. trigonocephalum.]

melolonthæ Hammerschmidt, in Leuck., 1835, 88, nomen nudum, t. h. an insect; Europe.—1835: Klepsitromis (type).

mentolatum Mueh., 1898, 19, for mentulatum.—1898: (Dist.).

mentulatum Rud., 1819a, 103, t. h. Coluber natrix Lacerta agilis, L. maculata; Europe—1819: Dist. 1845: D. (Brachylaimus). 1899: Lepoderma. 1899: Plagiorchis.

mergi Rud., 1819a, 121, t. h. Mergus albellus; C. E. V.—1819: Dist. [1850: D. baculus.]

merlangi Kuhn, 1829b, t. h. Gadus merlangus and Cymothoa oestroides on Boops.—1829: Octost. 1832: Octobothrium. 1832:? Polyst. 1838–40: Diclidophora. 1845: Octobothrium (Cyclocotyle). 1850: [Diclidophora longicollis]. 1888: Octocotyle. 1895: Dactylocotyle.

merlangi carbonarii Dies., 1858e, 341, renamed anonymum 1858e, 341; based on Bellingham, 1844, 428.—1858: Dist.

merlangi vulgaris Dies., 1858e, 341, renamed anonymum 1858e, 341; based on Bellingham, 1844, 428.—1858: Dist.

merlangorum Dies., 1855, 64, based on Bellingham, 1844.—1855: Dist.

merluccii Ben. & Hesse, 1863, 1864, 105, t. h. Merlucius vulgaris.—1863 or 1864: Anthocotyle (type).

merlucii Ben. & Hesse, 1863, 1864, 93, t. h. Merlucius vulgaris.—1863: Udonella.

merlucii Tasch., 1879k, 247, for merluccii (Anthocotyle).

meropis Rud., 1819a, 120, t. h. Merops apiaster; C. E. V.—1819: Dist. [1850: D. triangulare.] 1896: D. (Brachylaimus).

mesocœlium Cohn, 1903, 35, t. h. Draco volans; Java.—1903: Hoploderma (type). [1907: Pintneria, type.]

mesostoma Rud., 1803a, 28, t. h. Krametsvogel [Turdus iliacus]; Greifswald, November.—1803: Fasc. 1809: Dist. 1892: D. (Brachylaimus). 1902: Harmost.

mesosternum Linst., 1873, 101, apparently for mesostomum (Dist.).

metœcus Braun, 1900f, 389, t. h. Vespertilio lasiopterus, V. noctua; Vien. Mus.—1900: Dist. 1900: Crepidost. (type).

mexicana Vayssière, 1898, 227, t. h. Cambarus digneti; Mexico.—1898: Temnocephala.

michælis Mont., 1892, Oct. 7, 168, t. h. Cantharus vulgaris: Triest.—1892: Cotylogaster (type).

micracantha Dies., 1858d, 259, syn. Cerc. armata Fil., 1855b, 3–5, t. h. Triton punctatus, Lymnæus palustris.—1858: Cerc. (Acanthocephala).

micracanthum Stoss., 1889, 29, t. h. Pagellus erythrinus; Triest.—1889: Dist. 1903: D. (Dicrocœlium).

micracanthus Massa, 1903, see micrachanthus (Trochopus)

micrachanthus Massa, 1903, 225, t. h. Trigla hirundo.—1903: Trochopus.

microbothorium Fischder., 1902a, 21, for microbothrium (Paramphist.).

microbothrium Fischder., 1901a 369, t. h. Antelope dorcas; Coll. Vien. and Vet. School, Berlin.—1901: Paramphist.

microcanthus Massa, 1906, 66, for micracanthus (Trochopus).

microcephalum Baird, 1853, 58, t. h. Acanthias vulgaris; Falmouth Harbor.—1853: Dist. [D. veliporum.]

microcephalum Crep., 1837, 311, 1849, 64, in Corvus cornix.—1837: Dist.

microcephalum Rud., 1819a, 88 lapsus for microstomum.—1819: Amphist.

micrococcum Rud., 1819a, 101, t. h. Glareola austriaca; Arimini.—1819: Dist. 1901: Phaneropsolus. 1892: D. (Brachylaimus).

microcotyla Fil., 1854a, 7; 1854b, 260; t. h. Paludina vivipara, P. achatina; Lake Varese and Lombardia.—1854: Cerc. 1855: C. (Xiphidiocerc.). 1858: C. (Acanthocephala) [1858: Dist. tetracystis.] [1905: Cystagora, type.]

microcotyle Dies., 1858c, 340, t. h. Rhombus maximus; Ireland; based on Bellingham, 1844, 428.—1858: Dist.

microcristata Erc., 1881 or 1882, see Par., 1894, 161, t. h. Bythinia cristata; Bologna.—1881?: Cerc.

microdactyla Mont., 1903, 1, t. h. Dilocarcinus septemdentatus; Matto Grosso.—1903: Temnocephala.

micropharyngeum Luehe, 1898g, 623, t. h. flamingo; Berberei.—1898: Dist. 1900: Gymnophallus.

microphylla Ben., 1870, 70, t. h. Osmerus eperlanus.—1870: Dist.

microporum Mont., 1889, 322, t. h. Plagyodus ferox; Madeira.—1889: Dist. 1891: Apoblema. 1899: Hemiurus.

micropteri Marshall & Gilbert, 1905, 481, t. h. Micropterus salmoides, M. dolomieu; near Madison, Wis.—1905: Leuceruthrus (type).

micropterygis Richardi, 1902, 4, t. h. Micropteryx dumerilii.—1902: Didymozoon. 1902: Monost. 1902: Didymost. [1902: D. bipartitum.]

microsoma Rud., 1809a, 109, t. h. Perca marina; Naples.—1819: Dist.

microsomum Dies., 1850a, 370, for microsoma (Dist.).

microstomum Rud., 1809a, 50, t. h. Pleuronectes solea; Paris.—1809: Dist.

microstomum Rud., 1809a, 342, t. h. Corvus caryocatactes; Greifswald, Europe.—1809: Amphist. 1845: Holost.

microstomum Crep., 1829, 49, t. h. Fulica atra; Greifswald.—1829: Monost. [1850: M. mutabile.]

microtyla Moul., 1856a, 80, for microcotyle (Cerc.).

micrura Fil., 1857c, 5, t. h. Paludina impura.—1857: Cerc. 1858: C. (Acanthocephala). [1894: Dist. globiporum.]

midæ Dies., 1850a, 325, for mydæ.—Planaria. [1850: Monost. trigonocephalum.]

midas Kuhl & van Hasselt, (1824 or 1822?).—Polyst.

miescheri Zschokke, 1890, 764, t. h. Trutta salar.—1890: Dist. (Cladocœlium).

miescherii Mont., 1893, 153, for miescheri (Dist.).

migrans Duj., 1845a, 407, Brachylaimus advena renamed, hence type of Brachylaima; hosts Sorex araneus, S. leucodon.—1845: Dist. (Brachylaimus, type).

migras Stoss., 1892, 19, misprint for migrans 1845 (Dist.).

miliaris Brown, 1881, 329, misprint for militare 1803 (Dist.).

militaris Rud., 1803a, 30, t. h. Scolopax arquata; Greifswald, January.—1803: Fasc. 1809: Dist. (Echinost.). 1860: Echinost.

milvi Gmelin, 1790a, 3054, t. h. Milvus.—1790: Fasc. 1803: Dist. [1819: D. echinocephalum.]

minima Ben., 1870, 67, t. h. Clupea sprattus.—1870: Dist.

minimum Wagener, 1852, 558, t. h. Trigla microlepidota.—1852: Gasterost.—1858: Rhipidocotyle.

minimum Stoss., 1887, 96, t. h. Labrax lupus; Triest.—1887: Gasterost.

minor Haswell, 1887a, 284, t. h. Astacopsis bicarinatus; New South Wales.—1887: Temnocephala.

minor St.-Remy, 1898, 551, minus Olsson, 1876 [Octobothrium] renamed.—1898: Dactylocotyle.

minor Wagener, 1857, 60, t. h. Cyprinus alburnus.—1857: Dactylogyrus.

minor Goto, 1894a, 205, t. h. Scomber colias; Japan.—1894: Octocotyle.

minor Mont., 1888, 16, t. h. Scyllium.—1888: Pseudocotyle. 1905: P. (Leptocotyle, type).

minor Looss, 1901d, 437, t. h. Labrus merula; Triest.—1901: Derogenes.

minus Cerf., 1898b, 330, t. h. Raja sp.; Roscoff.—1898: Merizocotyle.

minus Olss., 1876, 10, t. h. Gadus melanostomus.—1876: Octobothrium.

minuta Looss, 1899b, 585, t. h. dogs and cats at Cairo and Ardea cinerea at Damietta, Egypt.—1899: Ascocotyle.

minuta Erc., 1881 or 1882, see Par., 1894, 163, t. h. Bythinia tentaculata; Bologna.—1881?: Cerc.

minuta Nitzsch, 1817, 46, in various fresh-water mollusks; Halle.—1817: Cerc. 1855: C. (Eucercaria). 1858: C. (Gymnocephala).

minutissimum Stoss., 1896, 130, t. h. Anas boschas; Doberdò.—1896: Monost.

minutissimus Looss, 1901, 618, t. h. Chelone mydas; Egypt.—1901: Pleurogonius.

minutum Cobbold, 1859d, 364, t. h. Hæmatopus ostralegus.—1859: Dist.

minutus Looss, 1901c, 604, t. h. Uranoscopus scaber; apparently Triest.—1900: Stephanochasmus.

minutus Fischder., 1901, 372, t. h. Antilope sp., Tragelaphus scriptus; Kamerun.—1901: Gastrothylax.

miocerca Mont., 1888, 77, for myocerca (Cerc.).

mirabilis Braun, 1891c, 218, t. h. Limnæus palustris var. corvus.—1891: Cerc.

mirus Looss, 1901d, 439, t. h. Labrus merula; Triest.—1901: Zoogonus (type).

mistroides Mont., 1896, 144, constrictum Leared, renamed.—[1896: Dist.] [1896: Mesogonimus.] [1908: Hapalotrema (type).]

mitsukurii Goto, 1894a, 227, t. h. Rhina sp.; Mitsugahama, Japan.—1894: Calicotyle. 1898: Calycotyle.

[*modestum* Sluiter, 1898 (Dist.), a tunicate.]

molæ Bl., 1847a, 326, t. h. Orthagoriscus mola.—1847: Trist. [1850: T. rudolphianum.]

molæ Maclaren, 1904, 573, t. h. Orthagoriscus mola.—1904: Nematobothrium.

molæ Rud., 1819a, 87, t. h. Orthagoriscus mola; Naples.—1819: Monost. [1850: Dist. okenii.]

molecula Linst., 1880, 51, t. h. Rallus pygmæus. 1880: Dist. 1892: D. (Brachylaimus).

molini Polonio, 1859, teste Par., 1894, 148, t. h. Rana esculenta; Padua.—1859: Dist.

molinii Par., 1894, 148, for molini, 1859 (Dist.).

molle Leidy, 1856, 43, t. h. Sternotherus odoratus; U. S. A. 1856: Monost. 1894: Dist. (Polyorchis). 1896: Polyorchis. 1896: Pleorchis.

mollis Wedl, 1857, 272, t. h. Cyprinus carpio.—1857: Gyrodactylus. 1858: Dactylogyrus.

mollisimum Mont., 1893, 96, for mollissimum (Apoblema).

mollissimum Levin., 1881, 59, t. h. Cottus scorpius; Egedesminde.—1881: Dist. 1886: D. (Apoblema). 1889: Apoblema. 1889: Hemiurus. [1905: Lecithaster gibbosus.] 1907: Lecithaster.

mollissimun Mont., 1891, 521, for mollissimum (Apoblema).

mollussinum Mont., 1891, 520, for mollissimum (Apoblema).

molvæ Ben. & Hesse, 1863, 1864, 94, t. h. Lota molva.—1863, 1864: Pteronella (type). 1878: Udonella.

molvæ Cerf., 1895h, 944.—1895: Dactylocotyle.

monas Rud., 1819a, 679, t. h. Amphisbæna sp.; Brazil.—1819: Dist. 1896: D. (Brachylaimus).

monenteron Wagener, 1857, 52, etc., t. h. Esox lucius.—1857: Dactylogyrus. 1858: Tetraonchus, probably type.

mongeotii Bory de St.-Vincent, 1823a, 354, in water.—1823: Cerc.

monorchis Stoss., 1890, 40, t. h. Cantharus orbicularis; Triest.—1890: Dist. 1893: D. (Monorchis, type). 1902: Monorchis, type.

monostomi Linst., 1896i, in 375, perhaps young of Monost. mutabile, t. h. Lymnæa ovata, L. peregra; Germany.—1896: Cerc.

monroi Goodsir, (1844), t. h. Gadus morrhua.—1844: Neuronaia, type.

monroii Goodsir, teste Gulliver, 1872, 103, see monroi (Neuronaia).

monstruosum Braun, 1901, 944, t. h. Corone venustissima; West Indies.—1901: Ochetosoma (type).

monticelli Mont., 1902, 143, for monticellii (Epibdella).

monticellii Lint., 1898, 518, t. h. Remora remora; Woods Hole.—1898: Dist. 1899: Hemiurus.

monticellii Stoss., 1904, 2, t. h. Tropidonotus viperinus, intestine; Naples.—1904: Astiotrema.

monticellii Scott, 1902, 300, t. h. Raia clavata; Scotland.—1902: Acanthocotyle.

monticellii Par. & Perugia (1895), 2.—1895: Phylline. 1896: Epibdella (Phylline). 1903: E. (Benedenia).

mordax Looss, 1899b, 688, t. h. Pelecanus onocrotalus; Egypt.—1899: Echinost.

mordens Braun, 1901g, 941, t. h. Rallus sp.; Brazil.—1901: Harmost.

mormiri Mont., 1888a, 34, for mormyri (Microcotyle).

mormyri Lorenz, 1878a, 21, t. h. Pagellus mormyrus; Triest.—1878: Microcotyle.

mormyri Stoss., 1885, 160, t. h. Pagellus mormyrus; Triest.—1885: Dist. 1886: D. (Brachylaimus). [1899: ?Creadium.]

mormyris Hausmann, 1897b, 28, for mormyri (Dist.).

morrhuæ Ben. & Hesse, 1863, 106, t. h. Gadus morrhua.—1863: Pterocotyle. 1879: Octobothrium. 1890: O. (Pterocotyle). 1898: Dactylocotyle.

motellæ Ben., 1870, 63, t. h. Motella mustela.—1870: Dist.

[***mucosum*** von Dr. (Dist.), a tunicate.]

mühlingi Jægers., 1899a, 7, t. h. Larus ridibundus; Pillau.—1899: Dist. 1899: Tocotrema.

muehlingi Looss, 1899b, 586, for mühlingi (Tocotrema).

muellerii, see mülleri (Dist.).

mülleri Cobbold, 1860a, 50, t. h. Petromyzon fluviatilis.—1860: Diplost.

mülleri Levin., 1881a, 56, t. h. Cottus scorpius, Gadus ovak; Egedesminde.—1881: Dist. 1886: D. (Brachylaimus). 1899: Progonus (type). [1902: Genarches (type).] 1905: Genarches (type).

mugilis Vogt, 1878, 327, t. h. Mugil cephalus; Roscoff.—1878: Microcotyle.

mugylis Sons., 1891, 253, for mugilis (Microcotyle).

mullerii Mont., 1888, 34, 37, for mülleri (Dist.).

mulli Stoss., 1883, 114, t. h. Mullus barbatus; Triest.—1883: Dist. 1886: D. (Echinost.).

multilobum Cobbold, 1860a, 46, t. h. Charadrius pluvialis.—1860: Holost.

munroi Brown, 1899a, 490, for monroi (Neuronaia).

murænulæ Cobbold, 1860a, 43, for maræenulæ (Monost.).—[1860: M. braunii.]

muris Erc., 1882c, pl. 3, figs. 16-21.—1882: Dist.

muris hepatica Rœderer, 1762, 537, t. h. Mus musculus; Germany.—1762: Fasc. [1905: Cysticercus fasciolaris.]

musculi Rud., 1819a, 119, t. h. Mus musculus; Cat. Vien.—1819: Dist. [See D. recurvum.]

musculicola Waldenburg, 1860, 12, t. h. Cyprinus, Perca fluviatilis.—1860: Holost. 1892: Diplost. 1894: Tetracotyle.

musculorum Braun, 1893, 871, musculorum percæ, 1860, renamed; in Perca fluviatilis.—1893: Dist.

musculorum percæ Waldenburg, 1860, 16, t. h. Perca fluviatilis.—1860: Dist.

musculorum suis Duncker, 1896, 279, t. h. Sus scrofa dom.; Germany.—1896: Dist. [1898: Agamodistomum suis.]

musculosum Johnston, 1904, 112, t. h. Sterna bergii.—1904: Holost.

musculum Brett, 1880a, 453, t. h. Ovis aries.—1880: Dist.

mutabile Mol., 1859, 833, t. h. Podarcis muralis; Padua, Italy.—1859: Dist. 1895: D. (Dicrocœlium). 1901: Dicrocœlium. 1902: Anchitrema.

mutabile Zed., 1800a, xvi, t. h. Fulica chloropus; Germany.—1800: Monost. 1809: Monost. (Monost.). 1835: Amphist. 1890 (1888?): Monost. (type). [1892: Cyclocœlum, type.] [1901: Cyclocœlum, type.] 1902: Cyclocœlum (type). 1904: (Cyclocœlium).

mutabile Dies., 1850a, 301, Diplodiscus diesingi renamed, t. h. Planorbis nitidus; Ticini.—1850: Diplocotyle (type). 1894: Diplodiscus (Diplocotyle). [1858: Diplodiscus subclavatus.]

mutabilis Schrank, 1803, 210.—1803: Fasc.

mutabilis Dies., 1850a, 317, urnigerum 1819 renamed, t. h. Pelophylax esculentus; Europe.—1850: Codonocephalus (type). 1896: Diplost. (Codonocephalus).

mutabilis Dies., 1839a, 234, t. h. Cataphractus n. sp. [Cichla temensis]; Rio Negro, Brazil.—1839: Aspidocotylus (type). 1850: Aspidocotyle (type).

mutabilis Stoss., 1902, 579, t. h. Anguillula vulgaris; Triest.—1902: Loborchis. 1903: Helicometra.

mutablilis Eichwald, ——.———: Planaria.

mydæ Braun, in Rud., 1809a, 336, as syn. of Monost. trigonocephalum.—1809: Planaria.

mydæ, see midas (Polyst.).

mydas, see midas.

myliobatis Tasch., 1878, 574, t. h. Myliobatis aquila; Naples.—1878: Monocotyle (type).

myocerca Villot, 1878, 32, t. h. Scrobicularia tenuis.—1878: Cerc.

mystacidis Linst. 1896i, 379, t. h. Mystacides nigra.—1896: Dist.

myzura Pag., 1881, 18, t. h. Neritina fluviatilis.—1881: Cerc.

naia Duj., 1845a, 387, for naja.—1845: Dist. (Dicrocœlium).

naidis proboscidiæ Dies., 1858d, 283.—1858: Cercariæum.

naja Rud., 1819a, 99, t. h. Coluber natrix; Berlin.—1819: Dist. 1845: D. (Dicrocœlium). 1899: Macrodera (type). 1902: Saphedera (type).

nana Rud., 1802b, 68, t. h. Scolopax gallinula; Greifswald, July.—1802: Fasc. 1809: Dist. 1901: Plagiorchis.

nanodes Braun, 1901g, 942, t. h. Falco nitidus; Brazil.—1901: Urorygma (type).

nardoi Polonio, 1859, see Par., 1894, 147, t. h. Lacerta muralis; Padua.—1859: Dist.

nassæ mutabilis Fil., 1855b, 22.—1855: Dist.

natator Claparède, 1863a, 13, free.—1863: Onchogaster (type).

nattereri Cobbold, 1860a, 52, cornu Dies., 1839a, renamed; t. h. Callichthys vacu; Brazil.—1860: Amphist.

negacotyle Dieş., 1850a, 379, misprint for megacotyle (Dist.).

neglecta Fil., 1854b, 278, t. h. Lymnæus peregor; prope Augustam Taurinorum.—1854: Cerc. 1855: C. (Eucercaria). 1858: C. (Gymnocephala).

neglectum Linst., 1887d, 101, t. h. Rana temporaria.—1887: Dist. 1889: D. (Dicrocœlium). [1899: Pleurogenes claviger.]

nematoides Cohn, 1904, 238, t. h. Aquila albicilla.—1904: Pronopharynx (type).

nematoides Crep., 1846, 129, t. h. Falco albicilla.—1846: Monost.

nematoides Much., 1898, 18, t. h. Tropidonotus natrix; East Prussia.—1898: Dist. 1899: Telorchis.

nephriticum Mehlis, in Crep., 1846, 138, t. h. Colymbus arcticus.—1846: Monost. 1904: Eucotyle (type).

nephrocephalum Dies., 1850a, 391, t. h. Turdus saxatilis; M. C. V.—1850: Dist. 1860: Echinost.

nephrocephalum Dies., 1858c, 327, in Sphargus coriacea; N. America; renicapite Leidy, 1856, renamed.—1858: Monost.

nephropis Cunningham, 1884a, 399, t. h. Nephrops norwegicus; Firth of Forth.—1884: Stichocotyle (type).

neuronaia monroii Maddox, 1867, 97, see monroii.—1867: Dist.

neuronaii monroii Cobbold, 1872b, 52, for neuronaia monroii (Dist.).

nigra Mueller, 1774, 54, in rivo.—1774: Fasc. 1787: Planaria.

nigrescens Olss., 1876, 19, t. h. Lophius piscatorius.—1876: Dist.

nigroflavum Rud., 1819a, 118, t. h. Orthagoriscus mola; Naples.—1819: Dist. (Echinost.). 1893: D. (Accacœlium). 1899: Accacœlium. 1903: Echinost.

nigropunctatum Linst., 1883, 310, t. h. a bird "Akatza;" Turkestan.—1883: Monost.

nigrostavum Deslongchamps, 1829, 238, misprint for nigroflavum Rud. (Dist.).

nigrovenosum Bellingham, 1844, 429, t. h. Tropidonotus natrix; England.—1844: Dist. 1895: D. (Dicrocœlium). 1899: Lecithodendrium. 1902: Brachycœlium.

nigrovenosum natricis torquatæ Dies., 1855, 64, based on Bellingham, 1844.—1855: Dist.

nigrum Linst., 1883, 307, t. h. Corvus cornix.—1883: Dist.

nipponicum Goto, 1891a, 151, t. h. Carassius vulgaris.—1891: Diplozoon.

nitens Lint., 1898c, 534, t. h. Tylosurus caribbæus; Woods Hole.—1898: Dist.

nitidum Leidy, 1856, 45, t. h. Rana pipiens.—1856: Holost.

[*nitidum* Sluiter, 1898, 17 (Dist.), a tunicate.]

noctulæ Cobbold, 1860a, 39, vespertilionis Rud., renamed, t. h. Vespertilio noctula.—1860: Monost.

noctulæ Rud., 1819a, 119, t. h. Vespertilio noctula; C. E. V.—1819: Dist.

nocturnus Looss, 1907, 479, t. h. Athene noctua; Egypt.—1907: Philophthalmus.

nodulosa Linst., 1873, 3, t. h. Bythinia tentaculata.—1873: Cerc. [1894: C. virgula Fil.]

nodulosa Frœlich, 1791, 76, includes percæ cernuæ 1776, t. h. Perca cernua, P. fluviatilis.—1791: Fasc. 1800: Dist. 1845: Dist. (Crossodera, type). 1860: Crossodera. [1896: Bunodera, type.] 1899: Bunodera, type.

non coronata Crep., 1837a, 326.—1837: Dist. [As name of a group of distomes.]

nordmanni Dies., 1850a, 428, t. h. Brama mediterranea.—1850: Encotyllabe (type). 1878: Trist. 1890: Plectanocotyle.

normanni Braun, 1890a, 550, for nordmanni (Encotyllabe).

notidobiæ Linst., 1896i, 379, t. h. Notidobia ciliaris.—1876: Dist.

notulata Bosc, 1802a, 254.—1802: Planaria.

novæ-zelandiæ Haswell, 1887a, 284, t. h. Paranephrops setosus; New Zealand.—1887: Temnocephala.

noverca Braun, 1902, 836, "conjunctum Cobbold" of Lewis & Cunningham, 1872, renamed, t. h. Homo; India.—1902: Opisthorchis. 1907: Dist.

nozawæ Goto, 1894a, 249, t. h. Thynnus sibi; Japan.—1894: Trist.

obesa Ben., 1870, 33, t. h. Cottus scorpius.—1870: Dist.

obesum Looss, 1902h, 135, t. h. Mugil auratus, M. cephalus, M. chelo; Triest.—1902: Saccocœlium (type).

obesum Dies., 1850a, 361, t. h. Leporinus friderici, Salminus brevidens, Xiphostoma cuvieri; Brazil.—1850: Dist.

obesus Crep., 1851b, 292, t. h. Lacerta agilis.—1851: Tetrathyrus (type). 1866: Petrathyrus. [Monost. lacertæ.] [1860: Monost. gurltii.] [Dithyridium, Piestocystis, cestode.]

obliquus Looss, 1901, 30 Oct., 566, "trigonocephalus Rud." of Looss, 1899b, 666, 756, figs. 84–86.—1901: Pronocephalus (type).

oblonga Cobbold, 1858b, 168, t. h. Delphinus phocæna.—1858: Campula (type). 1891: Dist. 1892: D. (Brachylaimus). 1898: Opisthorchis.

oblongnum Mont., 1888a, 57, for oblongum (Polyst.).

oblongum Cobbold of Braun, see Looss, 1902m, 716 (Brachycladium).

oblongum R. Wright, 1879, 12, t. h. Aromochelys (Sternothærus) odoratus; Toronto, Canada.—1879: Polyst.

obovatum Mol., 1858, 288, t. h. Chrysophris aurata; Padua.—1859: Dist. 1886: D. (Brachylaimus). [1899: Creadiinæ.] 1901: Allocreadium.

obscura Mueller, 1774, 65, in piscinis.—1774: Fasc. 1776: Planaria.

obscura Sons., 1892, Oct. 7, 138, t. h. Limnæa natalensis; Cairo, Egypt.—1892: Cerc.

obscurum Staff., 1904, 484, t. h. Lophius piscatorius; Canada.—1904: Leptosoma (type).

obscurum Leidy, 1887, 24, t. h. Megalops thrissoides; Coll. Army Med. Mus., Wash.—1887: Monost.

obtusum Looss, 1896b, 78, t. h. caméléon, Alexandria, Egypt.—1896: Dist. 1899: Lecithodendrium.

occidentalis Nickerson, 1900, 250, t. h. sheepshead; Mississippi Valley.—1900: Cotylogaster.

occidualis Staff., 1905, 687, t. h. Rana clamata, R. catesbiana; Canada.—1905: Halipegus.

occultum Staff., 1905, 682, t. h. Diemyctylus viridescens Raf., Rana virescens; Canada.—1905: Manodist. (type).

ocellata LaValette, 1855, 22, t. h. Limnæus stagnalis.—1855: Cerc. [1858: Histrionellina fissicauda.]

ocellatum Rud., 1819a, 125, t. h. Testudo orbicularis; Arimini.—1819: Polyst. 1828: Hexacoctyla. 1828: Hexacotyle.

ochreatum Nitzsch, in Giebel, 1857, 265, t. h. Falco haliaëtos.—1857: Holost.

ocreata Rud., 1802b, 79, halecis 1790 renamed; t. h. Clupea harengus.—1802: Fasc. 1809: Dist. 1845: D. (Apoblema). 1889: Apoblema. 1899: Pronopyge (type).

ocreata Gœze, 1782a, 182, t. h. Maulwurf; Europe.—1782: Fasc. 1788: Cucullanus. 17—: Festucaria (Schrank). 1800: Monost. 1809: M. (Monost). 1899: Dist. [1899: Ityogonimus, type.] 1902: Ityogonimus. [Distomum lorum.]

ocreatum Mol., of Olss., 1868, 48.—1868: Dist. 1891: Apoblema. 1899: Hemiurus. [1905: Brachyphallus crenatus (Rud.).]

ocreatum Rud. of Mol., 1858, 209, in Clupea alosa; Padua.—1858: Dist.

octopodis Cuvier, 1829b, 147.—1829: Hectocotylus (type).

octopodis delle Chiaje, 1841, 139.—1841: Dist.

octopodis delle Chiaje, teste Par., 1894, 169, t. h. Octopus vulgaris; Naples.— ——: Monost.

ocular de Bonis, 1882, 180, for oculare.- 1882: Dist. [Agamodist. ophthalmobium.]

oculare Moquin-Tandon, 1860, 347, for D. oculi humani.- 1860: Dist. 1860: Fasc. [Agamodist. ophthalmobium.]

oculatum Levin., 1881a, 64, t. h. Cottus scorpius; Egedesminde.- 1881: Dist. 1886: D. (Echinost.). 1905: Acanthopsolus (type).

oculi humani Gescheidt, 1833, 434, t. h. Homo; Dresden, Saxony.- 1833: Dist. 1858: Dicrocœlium. [Agamodist. ophthalmobium.]

oculis Moquin-Tandon, 1861, 375, for ocularis.- 1861: Fasc. [Agamodist. ophthalmobium.]

oculobium Cohn, 1902d, 712, t. h. Vanellus melanogast.; Greifswald coll.- 1902: Monost.

odontocotyla Dies., 1858d, 264, t. h. Lymnæus stagnalis; Berlin. 1858: Cerc.

œsophagi ardeæ nigræ Viborg, 1795, 242.- 1795: Dist. [1850: D. hians.]

oidemiæ nigræ Dies., 1858c, 322, based on Bellingham, 1844a, 340.- 1858: Amphist. [1858: Holost. anatis nigræ.]

okeni Ariola, 1906, 186, for okenii (Dist., Köllikeria).

okenii Kolliker, 1849c, 55, t. h. Brama raji.- 1849: Dist. [1860: Köllikeria.]

okul' humani Schneidemuehl, 1896, 302, for oculi humani.- 1896: Dist.

oligoon Linst., 1887d, 103, t. h. Gallinula chloropus.- 1887: Dist. 1892: D. (Brachylaimus).

oligoterus Mont., 1899, 76, t. h. Raja clavata; Naples.—1899: Acanthocotyle.

oloris Dies., 1855, 64, based on Bellingham, 1844, 427.- 1855: Dist.

olssoni Odhn., 1905, 326, t. h. Gadus melanostomus; Lumprenus maculatus from west coast of Sweden.- 1905. Podocotyle.

olssoni Rail., 1900, 239, t. h. Apus apus.—1900: Dicrocœlium.

onchacanthus Massa, 1906, 44, t. h. unknown; Triest.—1906: Trochopus.

onchidiocotyle Setti, 1899, 121, t. h. "tonno;" Portoferraio:—1899: Trist.

onycephalum Galli-Valerio, 1898, 923, misprint for oxycephalum (Dist.).

opaca Bory de St. Vincent, 1823a, 354, in infusions de pois.—1823: Cerc.

opaca Staff., 1902, 416, t. h. Bufo lentiginosus; America.—1902: Gorgodera. 1905: Gorgoderina.

opacum Ward, 1894, 173, t. h. Amia calva, Cambarus propinquus, Ictalurus punctatus, Perca flavescens; Lake St. Clair.—1894: Dist. 1894: D. (Brachycœlium). 1899: Levinsenia. 1901: Microphallus (type).

operculata Herbst, 1787a, 36.—1787: Planaria.

ophthalmobium Dies., 1850a, 334, oculi humani renamed; Dresden.—1850: Dist. 1892: Agamodist.

ophthalmothium Luehe in Stiles, 1903u, 223, for ophthalmobium (Agamodist.).

opisthotrias Lutz, 1895, 181, t. h. Didelphys aurita.—1895: Dist. 1899: Harmost. 1899: Heterolope.

orbicolare Sons., 1891, 262, misprint for orbiculare (Monost.).

orbiculare Dies., 1850a, 349, t. h. Cebus trivirgatus; Brazil.—1850: Dist. 1901: Phaneropsolus.

orbiculare Rud., 1819a, 83, t. h. Sparus salpa; Naples.—1819: Monost. (Monost.). 1901: Mesometra (type).

orbis Mueller, 1786, 138, in aqua, ubi Lemna, rarissime.—1786: Cerc. 1815: Furcocerca. 1827: Lecane.

oricola Leidy, 1884a, 47, t. h. Alligator mississippiensis; Florida.—1884: Dist. [1895: D. pseudostomum.]

oricula Mont., 1892, 715, misprint for oricola (Dist.).

ornata LaValette, 1855, 18, t. h. Planorbis corneus.—1855: Cerc. 1858: C. (Acanthocephala). [1858: Dist. clavigerum, type of Pleurogenes 1899.]

ornata Will.-Suhm, 1870, 9, t. h. Alligator lucius; Charleston.—1870: Polycotyle (type).

ornata Odhn., 1902, 22, t. h. Nilkrokodil.—1902: Stephanoprora (type).

ornatum Leidy, 1856, 43, t. h. Rana pipiens; Phila.—1856: Monost.

ornatum Cobbold, 1882a, 240, t. h. Elephas indicus; India.—1882: Amphist. 1895: Pseudodiscus.

ornithorhynchi Johnston, 1901, 334, t. h. Ornithorhynchus anatinus Shaw.—1901: Dist.

orphii Ben. & Hesse, 1863, 116; 1864, 116, t. h. Esox belone.—1863: Axine. [1879: A. belones.]

orthagorisci molæ Dies., 1855, 64, based on Bellingham, 1844, 429.—1855: Dist. [1850: D. macrocotyle.]

orthocœlium Fischder., 1901, 369, t. h. Bos kerabau; Ceylon.—1901: Paramphist.

osculatum Looss, 1901, 654, t. h. Motella vulgaris.—1901: Dist.

osleri R. Wright, 1879, 66, t. h. Necturus lateralis:? Canada.—1879: Sphyranura (type).

osleri Mont., 1888a, 8, for osleri (Sphyranura).

oti Rud., 1819a, 354, for otidis, syn. of macrocephalum.—1819: Festuc.

otidis Frœlich, 1802, 53, t. h. Strix otus.—1802: Festuc. [Amphist. macrocephalum.]

ovale Goto, 1894a, 241, t. h. Histiophorus orientalis; Misake, August.—1894: Trist. [1899: T. læve.]

ovalis Schrank, 1803, 86.—1803: Cerc.

ovata Villot, 1878, 20, t. h. Lygia oceanica.—1878: Cerc.

ovata Rud., 1803a, 25, t. h. Corvus frugilegus.—1803: Fasc. 1809: Dist. 1845: Dist. (Dicrocœlium). 1892: Cephalogonimus. 1896: D. (Cephalogonimus). 1899: Prosthogonimus (type). 1899: Prymnoprion (type). 1901: Prosthogonimus (type). 1902: Prostogonimus.

ovata Linst., 1877, 192.—1877: Tetracotyle. [1894: Holost. variegatum.]

ovata Goto, 1894a, 234, t. h. Anthias schegeli; Misaki, Japan, August.—1894: Epibdella. 1902: Trist. 1903: E. (Benedenia).

ovatum Lint., 1900, 269, t. h. Lobotes surinamensis; Woods Hole.—1900: Gasterost.

ovatum Dies., 1850a, 302, for Dist. luteum Baer, 2, 610, pl. 29, figs. 20–22, in Paludina vivipara; Regiomontii.—1850: Heterost. 1858: Cercariæum. [1858. Dist. luteum Wagener.]

ovatum Mol., 1859. 822. t. h. Gallinula crex: Batavii.—1859: Monost.

ovicola Brand., 1894a. 303. t. h. Arius commersonii: Brazil.—1894: Fridericianella (type).

oviforme Poir., 1886. 26. t. h. Nycticebus javanicus.—1886: Dist. 1892: Dist. (Brachycœlium). 1899: Phaneropsolus. 1899: Lecithodendrium.

ovis Cobbold, 1885a. 499. t. h. Ovis.—1885: Bilharzia.

ovocaudatum Vulpian, 1859. 150. t. h. Rana viridis.—1859: Dist. 1899: Halipegus (type).

ovofarctum Odhn., 1902. 153. t. h. Synodontis sp.: Omdurman.—1902: Dist.

ovopunctatum Stoss., 1902. 15. t. h. Numenius arquata.—1902: Cyclocœlum.

ovum Crep., 1846, 159. t. h. Planorbis marginatus.—1846: Dist.

oxycephalikum Schneidemuehl. 1896. 303, for oxycephalum (Dist.).

oxycephalum Rud., 1819a. 98. t. h. Anas boschas, A. clypeata.—1819: Dist. 1896: Echinost.

oxycephalum Dies., 1836d. 238. t. h. Salmo auratus, S. pacu and Silurus megacephalus at Cuyaba, and Salmo pacupeba at Rio Panara and Rio Araguay; Brazil.—1836: Amphist. 1905: Chiorchis.

oxyurum Crep., 1825, 48. t. h. Anas marila; Germany.—1825: Dist. 1902: Psilost.

pachisomum Par., 1894, 155. for pachysoma (Dist.).

pachycerca Dies., 1858d, 257, includes C. brachyura Lespés, t. h. Trochus cinereus; Francogalliæ.—1858: Cerc. (Acanthocephala).

pachycerca Claparède, 1863a, 12, free form; St. Vaast.—1863: Cerc.

pachyderma Braun, 1899a, 629, t. h. Chelone atra.—1899: Dist.

pachysoma Eysenhardt, 1829, 144, t. h. Mugil auratus.—1829: Dist. 1886: D. (Podocotyle.) 1893: D. (Monorchis). 1898: Podocotyle. 1902: Haplosplanchnus (type).

parifica Steenstrup, 1842, 74.—1842: Dist.

parifica Ben., 1858a, 1861a, 86, as syn. of Dist. militare.—1858: Cerc.

pagelli Ben., 1870, 1871a, 43, t. h. Pagellus centrodontus; Belgium.—1870: Dist. 1886: D. (Cladocœlium).

pagelli Ben. & Hesse, 1863, 80, t. h. Pagellus centrodontus.—1863: Encotyllabe. 1878: Trist.

pagenstecheri Ssinitzin, 1905, 34, Dist. cygnoides Zed. of Pag.—1905: Gorgodera.

palæmonis Linst., 1877b, 186, t. h. Palæmon serratus.—1877: Dist.

[*palea* (Nitzschia), a diatom.]

paliatum Braun, 1892a, 608, misprint for palliatum (Dist.).

pallasii Poir., 1885, 13, t. h. Delphinus phocæna.—1885: Dist. 1892: D. (Dicrocœlium).

pallenisceum Shipley & Hornell, 1905, 53, t. h. Balistes sp.; Ceylon.—1905: Dist.

pallens Rud., 1819a, 111, t. h. Sparus aurata; Naples.—1819: Dist. 1886: D. (Dicrocœlium).

palliatum Looss, 1885a, 390, t. h. Delphinus delphis.—1885: Dist. 1892: Cladocœlium. 1899: Brachycladium (type). 1901: Campula.

pallidum Staff., 1904, 487, t. h. Fundulus heteroclitus; Woods Hole.—1904: Homalometron (type).

pallidus Looss, 1902n, 889, t. h. Milvus ægyptiacus; Egypt.—1902: Heterophyes.

palmatum Rentsch, 1860, 38, t. h. Seestichling, Gasterosteus spinachia.—1860: Dist.

palmatum Leuck., 1830, 612, t. h. Gadus molva; Germany.—1830: Octobothrium. 1842: Octobothrium. 1845: Octobothrium (Cyclocotyle). 1850: Diclidophora. 1859: Octoplectanum. 1864: Pterocotyle (type). 1879: Octobothrium. 1890: Octobothrium (Pterocotyle). 1895: Dactylocotyle.

palonia J. Poir., 1883, 73, t. h. Palonia frontalis; Java.—1883: Homalogaster, type.

palpebrarum Looss, 1899, 587, t. h. Corvus cornix, Milvus parasiticus: Egypt.—1899: Philophthalmus (type).

paludinæ impuræ Baer, see Dies., 1855a, 400.—1855: Cerc. 1855: Dist. 1855: Cercariæum.

paludinæ impuræ Fil., 1854, 279, t. h. Paludina impura.—1854: Dist. 1855: Cercariæum. [1858: C. p. i. inerme.]

paludinæ impuræ armatum Fil., 1857, 207, t. h. Paludina impura.—1857: Dist. 1858: Cercariæum.

paludinæ impuræ inerme Fil., 1857, 207.- 1857: Dist. 1858: Cercariæum. [1858: Dist. perlatum.]

paludinæ impuræ (tentaculorum) Dies., 1855, 399, based on Baer, 1827b, 655, in Paludina impura; Regiomontii.—1855: Cercariæum.

paludinæ viviparæ Dies., 1855, 399=helicis viviparæ renamed, t. h. Paludina vivipara; Vilnæ.—1855: Cercariæum.

[*pancerii* D. Valle (Dist.) a tunicate.]

pancerii Sons., 1891, 303, t. h. Umbrina cirrhosa; Italy.—1891: Microcotyle.

pancreaticum Janson, 1889a, or Rail., 1890, 143, t. h. sheep; Japan.—1890: Dist. 1897: Dicrocœlium. 1907: Eurytrema, type.

pancreaticum Katsurada & Saita, 1906, 501, t. h. cattle; Japan.—1906: Dist. [Eurytrema.]

pancreatinum Ward, 1895, 335, for pancreaticum (Dist.).

pandum Braun, 1901a, 48, t. h. Thalassochelys caretta; Naples.—1901: Monost.

panduriforme Rail., 1900, 240, t. h. Pica pica.—1900: Dicrocœlium.

pangasii MacCallum, 1905, 668, t. h. Pangasius nasutus; Palembang, Sumatra.—1905: Cladorchis.

papillatum Rud., 1814a, 105, t. h. Anas boschas fera; Germany.—1814: Dist.

papillatum Ben., 1858a, 38.—1858: Trist.

papillatum Cobbold, 1882, 240, t. h. Elephas indicus; India.—1882: Amphist.

papilliferum Mol., 1859, 290, t. h. Belone acus; Batavii.—1859: Dist. 1886: D. (Crossodera).

papilliferum Braun, 1892a, 586, for papillatum Cobbold, 1882 (Amphist.).

papillorum Juel, 1889, 14, for papillosum (Trist.).

papillosa Erc., 1881 or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata; Bologna.—1881?: Cerc.

[*papillosa* Crep., 1837a, 326, name of a group of Dist.]

papillosa Lint., 1898, 508, t. h. Gadus callarias; Woods Hole.—1898: Nitzschia. 1904: Lintonia (type).

papillosum Dies., 1836, 313, t. h. Xiphias gladius.—1836: Trist. 1840: Capsala.

papillosum Dies., 1850a, 381, D. beroës Will, renamed; t. h. Beroe rufescens; Triest.—1850: Dist. 1860: Crossodera.

paradoxum Nord., 1832a, 56, t. h. Cyprinus brama.—1832: Diplozoon (type).

paradoxum Carus, 1833a, 1835, 86, t. h. Succinea amphibia, Helix putris; Saxony.—1835: Leucochloridium (type).

paradoxus Rud., 1810a, 257, t. h. Tetrodon mola; Europe.—1810: Schisturus (type).

paradoxus Crep., 1839a, 292, t. h. Perca lucioperca; Greifswald.- 1839: Ancyrocephalus (type). 1878: Dactylogyrus. [1879: Tetraonchus unguiculatus.]

parallelum Looss, 1901l, 622, t. h. Chelone mydas; Alexandria, from Egyptian coast.—1901: Microscaphidium. 1902: Angiodictyum (type).

parasitica Jægers., 1897, 707, t. h. Raja clavata, R. lævis; Kattegat.—1897: Micropharynx (type) [ectoparasitic triclad].

paronæ Mont., 1893, 43, t. h. Seriola dumerilii.—1893: Dist.

parva Erc., 1881 or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata; Bologna.—1881?: Cerc.

[*parva* Sluiter, 1900, 6 (Dist.), a tunicate.]

parva Stoss., 1904, 10, t. h. Rana esculenta; Istria centrale.—1904: Brachymetra (type).

parvulum Staff., 1904, 494, t. h. Semotilus bullaris; Canada.—1904: Diplost.

parvulus Marshall & Gilbert, 1905, 478, t. h. Micropterus salmoides; near Madison, Wis.—1905: Cæcincola (type).

parvus Braun, 1901, 19, t. h. Testudo orbicularis; Vien. Mus.—1901: Telorchis. 1905: T. (Cercorchis).

parvus Looss, 1902i, 118, t. h. Sargus annularis, S. rondeletii; Triest.- 1902: Monorchis.

pastinacæ Scott, 1904, 279, t. h. Trygon pastinaca; Scotland.—1904: Heterocotyle, type.

patagiatum Crep., 1846, 135, t. h. Ardea stellaris.—1846: Holost.

patellare Sturges, 1897, Sept., 57, t. h. Triturus (Molge) pyrrhogaster Boie.—**1897: Dist.** [1899: Phyllodist.] 1899: Spathidium. 1901: Phyllodist.

pectinata Huet, 1891a, 162, t. h. Donax anatinum.—1891: Cerc.

pectinatum Lint., 1905, 327, t. h. Trachinotus carolinus, Bairdiella chrysura; Beaufort, N. C.—1905: Dist.

pedata Schrank, (1796), 335, t. h. Anas querquedula.—1796: Festuc. [1905: Catatropis verrucosa.]

pedatum Looss, 1899, 592, t. h. Bagrus bayad, B. docmac; Cairo, Egypt.—1899: Glossidium (type).

pedatum Dies., 1850a, 309, t. h. Didelphis myosurus, D. cancrivorus; Brazil.—1850: Hemist.

pedatus Wagener, 1857, 99, t. h. Julis.—1857: Dactylogyrus. 1858: Diplectanum.

pedatus Dies., 1836c, 310, bellones 1794, renamed, t. h. Esox belone.—1836: Heteracanthus. [1794: Axine, type.]

pedicellatum Stoss., 1887, 184, t. h. Chrysophrys aurata; Triest.—1887: Dist. 1898: Podocotyle. [1899: Creadiinæ.]

pedocotyle Leidy, 1890, 282, t. h. Mola rotunda; New Jersey.—1890: Dist.

pegorchis Stoss., 1901, 94, t. h. Mæna smaris; Triest.—1901: Creadium. 1901: Allocreadium. 1904: Lepocreadium.

pelagix Kœlliker, 1849, 53, t. h. Pelagia noctiluca; Naples.—1849: Dist. 1893: D. (Accacœlium). 1900: Accacœlium.

pelagica Mont., 1888, 45.—1888: Cerc.

pelagicum Staff., 1900, 399, at Passamaquoddy Bay, St. Andrews, New Brunswick.—1900: Dist. 1902: Hemiurus (Apoblema).

pelamydis Tasch., 1878, 176, t. h. Pelamys sarda; Naples.—1878: Trist.

pelamydis Tasch., 1879, 612, t. h. Pelamys sarda; Naples.—1879: Didymozoon.

pellucidum Linst., 1873, 95, t. h. Gallus domesticus.—1873: Dist. 1890: Cephalogonimus. 1892: D. (Dicrocœlium). 1892: Mesogonimus. 1899: Prymnoprion. 1899: Prosthogonimus.

pellucidum Schlotthauber, 1860, 129, t. h. Petromyzon fluviatilis.—1860: Holost.

pelophylacis esculenti Wedl, 1849, 197.—1849: Dist.

pendulum Looss, 1899b, 688, t. h. Recurvirostra avocetta; Egypt.—1899: Echinost.

perca Gmelin, 1790a, 3057, percæ cernuæ 1776 renamed; t. h. Perca cernua.—1790: Fasc. [1809: Dist. nodulosa.]

perca Mont., 1888a, 7, 30.—1888: Tetracotyle.

percæ cernuæ Mueller, 1776, 224, t. h. Perca cernua.—1776: Fasc. [1809: D. nodulosum.]

percæ fluviatilis Moul., 1856, 230.—1856: Tetracotyle. [1858: T. typica.]

percina Schrank, 1790, 123, t. h. Perca asper, P. vulgaris.—1790: Fasc. [1809: D. nodulosum.]

peregrinum Braun, 1900f, 389, t. h. Rhinolophus ferrum-equinum.—1900: Dist. 1900: Mesotretes (type).

pericardium Crep., 1849a, 78, D. helicis Leidy, renamed.—1849: Dist. [1858: Cercariæum vagans.]

perlatum Nord., 1832, 88, t. h. Cyprinus tinca.—1832: Dist. 1845: Dist. (Podocotyle). 1886: D. (Echinost.). 1899: Asymphylodora (type). 1903: Echinost.

perlatum var. *exspinosum* Hausmann, 1896, 390, t. h. Barbus fluviatilis; Switzerland.—1896: Dist.

permixtus Braun, 1901, 943, t. h. Hirundo rustica; Coll. Vienna.—1901: Plagiorchis. 1904: Dist.

perniciosum Taylor, 1884, 53, see endemicum.—1884: Dist. [1907: Clonorchis endemicum.]

perpastum Braun, 1902b, 86, n. n. for singularis of Looss.—1902: Stomylotrema (type).

perpusillus Looss, 1902, 134, t. h. Mugil chelo.—1902: Dicrogaster (type).

persicus Braun, 1901c, 334, t. h. Persian wolf.—1901: Cotylogonimus. 1902: Heterophyes.

personatum Poir., 1886, 11, host unknown; Gulf of Mexico.—1885: Dist.

perugiai Setti, 1898, 7 pp., t. h. Tetrapturus belone; Spezia.—1898: Trist.

petalosum Lander, in Looss, 1902m, 454, t. h. Acipenser rubicundus.—**1902: Dist.** [Bunodera]. 1904: Acrodactyla (type). See lintoni and cornuta.

petasatum Deslongchamps, 1824cc, 511, t. h. Hæmatopus ostralegus; Caen.—1824: Monost.

peteromyzi fluviatilis Dies., 1850a, 307, t. h. Peteromyzon fluviatilis.—1850: Diplost. 1892: Tylodelphys.

petiolatum Rail., 1900, 241, t. h. Garrulus glandarius.—1900: Dicrocœlium.

petromyzonis fluviatilis Dies., 1858c, 316, for peteromyzi fluv. (Diplost.).—1858: Tylodelphys.

petromyzontis Brown, 1899a, 489, t. h. Ammocœtes; Oxford, Eng.—1899: Tetracotyle.

phaneropsolus Stoss., 1902, 25, t. h. Totanus sp.; Yeddo, Japan.—1902: Hæmatotrephus.

phasiani galli Dies., 1855, 64.—1855: Dist.

philocholum Crep., 1845, 330, t. h. Delphinus phocæna, in liver.—1845: Dist.

philodryadum West, 1896, 322, t. h. Philodryas schottii; England.—1896: Dist. 1900: Opisthogonimus (type).

philomelæ Rud., 1819a, 120, t. h. Motacilla philomela; C. E. V.—1819: Dist. [1850: D. macrostomum.]

phœnicopteri Luehe, 1898g, 625, t. h. Flamingo; Berberei.—1898: Echinost.

phoxini Linst., 1896, 378, t. h. Phoxinus lævis.—1896: Dist.

phryganeæ Linst., 1877b, 185, t. h. Phryganea grandis.—1877: Dist.

phycidis Par. & Per., 1889, 743, t. h. Phycis blennoides; Genova.—1889: Dactylocotyle. 1890: Octobothrium. 1890: Dactycotyle. 1890: Octobothrium (Dactylocotyle).

physæ fontinalis Dies., 1855a, 400, t. h. Physa fontinalis; Regiomontii.—1855: Dist. 1855: Cercariæum.

physcon Luehe, 1901n, 478, t. h. Lophius piscatorius; Triest.—1901: Lecithochirium.

physophoræ Kœlliker, 1849c, 53, t. h. Physophora tetrasticha; Naples.—1849: Dist. [1850: D. geniculatum.]

pianæ Galli Valerio, 1898d, 145, t. h. Anas boschas; Busto Arsizio.—1898: Opistorchis. 1898: Opisthorchis.

picta Rud., 1802, 64, F. vespertilionis renamed; t. h. Fledermaus [Vespertilio murinus]; Greifswald.—1802: Fasc. [1809: Dist. lima.]

pictum Crep., 1837, 313, t. h. Ciconia alba.—1837: Dist. 1901: Stomylotrema.

pigmentata Sons., 1892, Oct. 7, 142, t. h. Physa alexandrina, P. micropleura; Cairo, Egypt.—1892: Cerc. [Amphist.]. [1902: A. conicum.]

pilchardei Mont., 1888a, 66, misprint for pilchardi (Octocotyle).

pilchardi Ben. & Hesse, 1863, 1864, 99, t. h. Clupea pilchardus.—1863: Octocotyle. 1879: Octobothrium. 1889: Octoplectanum.

pileata Rud., 1802, 65, t. h. Sterna hirundo; Greifswald.—1802: Festuc. 1803: Monost. 1809: M. (Monost.). 1819: Amphist. 1828: Holost. 1845: Holost.

pilcatum Brand., 1888a, 59, t. h. Sterna caspica, Larus glaucus; Wien. Mus.—1888: Hemist.

pileatum Rud. of Bremser, 1824, pl. 8, figs. 28–29.—1824: Amphist. [1850: Hemist. commutatum.]

pingue Mehlis in Crep., 1846, 138, t. h. Colymbus cristatus.—1846: Monost. 1904: Renicola (type).

pinguicola Treutler, 1793, 6, t. h. Homo.—1793: Hexathyridium (type). 1800: Polyst. 1809: Polyst. (Hexast.). 1828: Hexathiridium. 1833: Hexacotyle. [Hexast.] [Linguatula.]

pinguiculum Joy, 1835a, 505, for pinguicola (Polyst.).

pini Ben. & Hesse, 1863, 1864, 72, t. h. Trigla pini.—1863: Placunella (type). 1878: Trist. 1903: Trochopus.

pinnarum Wagener, 1857, 26, t. h. Gasterosteus.—1857: Dist.

pinnatum Will.-Suhm, (1873), 341.—1873: Dist.

piriforme Crep., 1846, 142, in Anas fusca, A. glacialis; see pyriforme.—1846: Dist.

piriforme Sons., 1895, 184, for pyriforme (Amphist.).

piscicola Odhn., 1902, 152, t. h. Gymnarchus niloticus.—1902: Opisthorchis.

pittacium Braun, 1901, 947, t. h. Strepsilas interpres.—1901: Dist.

planci Stoss., 1899, 5, t. h. Ranzania truncata; Triest.—1899: Podocotyle. 1902: Orophocotyle (type).

planicolle Rud., 1819a, 682, t. h. Pelecanus sula; Brazil.—1819: Dist. (Echinost.). [1850: Monost. echinostomum.] [1901] 1902: Anoictost.

planorbis carinati Fil., 1857c, 13, t. h. Planorbis carinatus; Turin.—1857: Dist. 1858: Cerc. (Acanthocephala). 1858: Cercariæum.

planorbis cornei Dies., 1850a, 298, based on Henle, 1835, 597, t. h. Planorbis corneus.—1850: Cerc. 1855: Cercariæum.

planorbis corneï Linst., 1877, 187.—1877: Dist.

planorbis cornei (*hepatis*) Dies., 1858d, 281, t. h. Planorbis corneus.—1858: Cercariæum.

planorbis cornei (*ovariorum*) Dies., 1858d, 281, for planorbis cornei 1850.—1858: Cercariæum.

platellæ Bosc, 1802a, v. 1, 273, see platessæ (Fasc.).

platessæ Mueller, 1784, 114, t. h. Pleuronectes platessa, int.—1784: Fasc. 1803: Dist. [1809: D. areolatum.]

platycephalum Crep., 1825a, 39, t. h. Colymbus rufogularis; Greifswald.—1825: Amphist. 1845: Holost.

platygaster Leuck., 1842a, 30, t. h. Gadus merlangus.—1842: Octobothrium. [1845: O. merlangi.]

platyura Crep., 1838b, 83, includes Axine belones, Heteracanthus pedatus, H. sagittatus.—1838: Axine.

platyura Leidy, 1891a, 416, free in pool with Lymnæus; Fort Bridger, Wyo.—1891: Cerc.

platyurum Much., 1896, 267, t. h. Harelda glacialis; East Prussia.—1896: Dist. 1899: Psilost. (type).

playfairii Forbes & Goodsir (1839).—1839: Tetrast.

plenus Staff., 1904, 484, t. h. Anarrhichas lupus; Canada.—1904: Derogenes.

plerotieum Braun, 1899e, 631, host?; Brazil.—1899: Dist. 1901: Telorchis.

plesiostomum Linst., 1883, 305, t. h. Perdix græca; Turkestan.—1883: Dist. 1892: D. (Brachylaimus). 1899: Dicrocœlium. [1899: Lyperosomum.]

pleurolophocerca Sons., 1892, Oct. 7, 138, t. h. Melania tubercolata, Cleopatra bulimoides; Cairo, Egypt.—1892: Cerc.

pleuronectes Mueller, 1773, 70, in aquis [etc.].—1773: Cerc. 1827: Phacus.

pleuronectis maximi Dies., 1855, 64, based on Bellingham, 1844, 428; renamed D. microcotyle. 1855: Dist.

plicatum Crep., 1829a, 878, t. h. Balæna rostrata; Rügen.—1827: Monost. 1891: Ogmogaster (type).

[*plumbeum* D. Valle, (Dist.), a tunicate.]

podomorphum Nitzsch, 1819, 399, t. h. Falco haliaëtos; Halle.—1819: Holost. 1850: Hemist.

podura Mueller, 1773, 66, in paludosis Lemna coopertis.—1773: Cerc. 1815: Furcocerca. 1827: Enchelys. 1828: Ichthydium, type.

poirieri Stoss., 1895, 227 (D. gelatinosum Poir., 1885).—1895: Dist. 1895: D. (Dicrocœlium). 1899: Telorchis. 1902: Telorchis. 1905: T. (Cercorchis).

poirieri Giard & Billet, 1892, 615, t. h. cattle; Tonkin.—1892: Homalogaster.

pollachi Mont., 1888, 66, for pollachii (Dactycotyle).

pollachii Ben. & Hesse, 1863, 1864, 90, t. h. Merlangus pollachius.—1863: Udonella.

pollachii Ben. & Hesse, 1863; 1864, 110, t. h. Merlangus pollachius.—1863: Dactycotyle (type). 1879: Octobothrium. 1883: Dactylocotyle. 1890: O. (Dactylocotyle).

polonica Kowal., 1895g, 41, t. h. Anas boschas fera, A. crecca L.; Dublany.—1895: Bilharzia. 1898: Schistosoma. 1899: Bilharziella (type).

polonii Mol., 1859, 291, t. h. Caranx trachurus; Batavii.—1859: Dist. 1886: D. (Echinost.).

polychroa Tasch., 1879, 36.—1879: Planaria.

polyclinorum Pag., 1862, 306, t. h. Polyclinum; Golf von Spezia.—1862: Dist.

polymastos Leuck., 1880, or Lejtenyi, 1880, t. h. Equus caballus; Egypt.—1880: Gastrodiscus. [1896: G. ægyptiacus.]

polymorpha Rud., 1802b, 70, F. anguillæ Gmelin renamed; t. h. Aal.—1802: Fasc. 1809: Dist.

polymorphum Fil., 1837a, 337, t. h. Planorbis submarginata; see also brachyura Diesing, 1850.—1837: Dist.

polymorphus Baer, 1827b, 570, t. h. Unio, Anodonta.—1827: Bucephalus (type). 1855: Bucephalus (Eubucephalus, type). 1856: Cerc. ——: Cerc. (Bucephalus).

polyoon Linst., 1887, 103, t. h. Gallinula chloropus.—1887: Dist.

polyorchis Stoss., 1889, 24, t. h. Corvina nigra; Triest.—1889: Dist. 1894: D. (Polyorchis, type). 1896: Polyorchis. 1896: Pleorchis (type).

pomatiæ Vaney & Conté, 1899, 194, t. h. Helix pomatiæ; Lyon.—1899: Cerc.

pomatomi Goto, 1899a, 278, t. h. Pomatomus saltatrix; Newport, R. I.—1899: Microcotyle.

pontalici Stoss., 1898, 178, for pontalliei (Dist.)

pontalliei Cobbold, 1860a, 10, t. h. Ardea minuta; D. cladocalium Dies., renamed.—1860: Dist.

porcorum Gmelin, 1790a, 3054.—1790: Fasc. hepatica.

poricola Schlotthauber, 1860, 129, t. h. Anas boschas.—1860: Ast. (type).

porrectum Braun, 1899b, 714, t. h. Saurophaga saurophaga; New Guinea.—1899: Dist. [1899: Lyperosomum.]

posticum Staff., 1905, Apr. 11, 692, t. h. Vespertilio subtilis Say; Canada; chilost. Mehlis of Staff., 1903, 827, renamed.—1905: Lecithodendrium.

poturzycensis Kowal., 1898g, 72, t. h. Anas boschas dom.—1898: Opisthorchis. 1898: O. simulans var. 1898: Campula. 1902: Metorchis.

præmorsum Nord., 1832, 55, t. h. Cyprinus brama; Europe.—1832: Monost. 1892: Monostomulum.

præteritus Looss, 1901e, 633, t. h. Labrax lupus; Triest.—1901: Acanthochasmus.

prenanti St.-Remy, 1890, 41, t. h. Raja oxyrhynchus; Roscoff.—1890: Onchocotyle. 1889: Rajonchocotyle.

pretiosus Ariola, 1902, 107, t. h. Thynnus vulgaris.—1902: Didymozoon.

prima Ssinitzin 1905, 147; 1906, 687, t. h. Aplexa hypnorum, Planorbis vortex compressa, Corethra, Ilybius; Warschau.—1905: Cerc.

primus Staff., 1905, 691, t. h. Eutenia sirtalis; Canada.—1905: Lechriorchis (type).

prismaticum Zed., 1800a, xvi, 150, t. h. Corvus frugilegus; Europe.—1800: Monost. 1809: M. (Monost.). [1892: Dist.]

pristiophori Johnston, 1902, 326, t. h. Pristiophorus cirratus Lath.—1902: Dist.

pristis Deslongchamps, in Lamouroux, 1824, 563; 1821, 281, t. h. Merlangus communis; Normandy.—1824: Dist. 1845: D. (Echinost.). 1860: Echinost. 1899: Anoiktost. 1899: Stephanost. 1901: Stephanochasmus.

problematicum Stoss., 1902, 14, includes Looss, 1899b, 660, t. h. Totanus calidris, T. glottis.—[1899: Cyclocœlum.] 1902: Cyclocœlum.

proboscideum Rud., 1814a, 106, Echinorhynchus crotali, 1808, renamed; America.—1814: Polyst. 1814: Polyst. (Pentast.). 1819: Pentast. [Porocephalus, type.]

producta Linst., 1903, 354, t. h. Solea vulgaris.—1903: Epibdella.

productus Staff., 1904, 485, t. h. Hemitripterus americanus; Canada.—1904: Sinistroporus.

productus Odhn., 1902, 24, t. h. Nilkrokodil; Sudan.—1902: Acanthochasmus.

propinquum Braun, 1901, 942, t. h. Dendrocalaptes scandens; Brazil.—1901: Glaphyrost.

proteus Brand., 1891, 19, t. h. Chelonia viridis.—1891: Monost. 1892: Notocotyle. 1899: Baris (type). 1900: Deuterobaris (type).

proxima Lespés, 1857, 116, t. h. Littorina littorea.—1857: Cerc. 1858: C. (Gymnocephala).

prussica Mueh., 1896, 590, t. h. Anas glacialis.—1896: Cyathocotyle (type).

pseudamphistomum Crep., 1846, 146, t. h. Chelonia mydas.—1846: Monost.

pseudoechinatum Olss., 1876, 21, t. h. Larus marinus; Scandinavia.—1876: Dist. 1892: Echinost.

pseudofelineus Ward, 1901, 180, "Dist. felineum" of Ward, 1895, not Rivolta, 1884, renamed, t. h. Felis catus dom.; Lincoln, Nebr.—1901: Opisthorchis.

pseudostoma Will.-Suhm, 1870, 11, t. h. Alligator lucius.—1870: Dist. 1886: Diplost. 1895: D. (Brachylaimus).

pudens Lint., 1900a, 269, t. h. Paralichthys dentatus; Woods Holl.—1900: Dist.

pugio Linst., 1887, 105, t. h. Limnæa ovata.—1887: Cerc.

pugnax LaValette, 1855, 19, t. h. Paludina vivipara.—1855: Cerc. [1855: C. microcotyla.]

pulchellum Rud., 1819a, 94, t. h. Labrus cynædus; Naples.—1819: Dist. 1902: Helicometra (type). 1903: D. (Dicrocœlium).

pulcherrima Weyenbergh, 1876, 167, t. h. Hypostomus plecostomus; Argentina.—1876: Amphist. 1878: Dist.

pulicis Linst., 1892, 333, t. h. Gammarus pulex.—1892: Dist.

pulmonale Linst., 1904, 678, t. h. Halicore australis; Australia.—1904: Opisthotrema.

pulmonale Bælz, 1883, April, 236, t. h. Homo [see westermanii Kerbert, 1878].—1883: Dist. 1889: Dist. 1890: Mesogonimus. 1899: Paragonimus.

pulmonalis colubri natricis Viborg, 1795, 243.—1795: Dist. [D. naja].

pulmonar La Clínica de Málaga, 1883, 308, for pulmonale, see westermanii.—1883: Dist.

pulmonis Kiyona, Suga, and Yamagata, 1881, teste Ijima, 1889b, 148, see westermanii.—1881: Dist.

pulmonum Bælz, 1880, Sept., 721, t. h. Homo, see westermanii.—1880: Gregarina. 1884: Dist. [1899: Paragonimus.]

pulverulenta Braun, 1901g, 946, t. h. Anas querquedula; Dongola.—1901: Bilharziella.

pulvinatum Braun, 1899, 630, t. h. Flussschildkrœte; Brazil.—1899: Dist.

pumilio Looss, 1896, 154, t. h. Pelecanus onocrotalus; Egypt.—1896: Monost. 1899: Haplorchis (type).

punctata Mueller, 1774, 57, in pratis inundatis primovere.—1774: Fasc. 1787: Planaria.

punctatum Dies., 1850a, 329, misprint for punctum (Dist.).

punctum Zed., 1800a, 164, t. h. Cyprinus barbus; Europe.—1800: Dist. 1828: Fasc.

punctum Erc., 1881 or 1882, see Par., 1894, 164, t. h. Bythinia tentaculata: Bologna.—1881: Cerc.

pungens Linst., 1894b, 333, t. h. Podiceps minor; Seeburger See.—1894: Dist. (Echinost.). 1899: Echinost.

pusilla Braun, D. M., 1790a, 62, t. h. Erinaceus europæus; Europe.—1790: Planaria. 1790: Fasc. 1803: Dist. 1892: Agamodist.

pusilla Looss, 1896b, 229, t. h. Vivipara unicolor Olivier; Damanhour.—1896: Cerc.

pusilla Staff., 1904, 485, t. h. Anarrhichas lupus; Canada.—1904: Neophasis (type).

pusillum Staff., 1904, 494, t. h. Stizostedion vitreum; Canada.—1904: Gasterost.

pusio Eichwald. — · — : Planaria.

putorii Linst., 1877, 191, t. h. Fœtorius putorius.—1877: Diplost.

putorii Mol., 1858, 131, t. h. Mustela putorius: Patavia.- 1858: Dist. 1892: Agamodist.

putorii Gmelin, 1790a, 3053, t. h. Mustela putorius.—1790: Fasc. 1790: Planaria. 1893: Dist. [1850: D. trigonocephalum.]

putrescens Looss, 1902, 135, t. h. Mugil auratus.—1902: Lecithobotrys (type).

pycnoporus Stoss., 1901, 92, t. h. Sargus salviani; Triest.- 1901: Holorchis (type).

pygmæa var. *simile* Jægers., 1900c, 737, t. h.- 1900: Levinsenia. [1902: Spelotrema.] [1902: Dist.]

pygmæum Levin., 1881a, 73, t. h. Somateria mollisima; Egedesminde.—1881: Dist. 1892: D. (Brachycœlium). 1899: Levinsenia. 1901: Spelotrema (type, Dec. 31). 1903: Levinseniella.

pyramidum Looss, 1896b, 76, t. h. Rhinolopus hippocrepis; Ghizeh.—1896: Dist. 1899: Lecithodendrium.

pyriforme Dies., 1838a, 189, 1839a, 236, t. h. Tapirus americanus; Matogrosso or Cachoeira do Bananeira, Brazil.—1839: Amphist. 1901: Cladorchis.

pyriforme Crep., 1837a, 316, t. h. Eisente, Anas glacialis.—1837: Dist.

pyriforme Lint., 1900, 269, t. h. Palinurichthys perciformis; Woods Holl.—1900: Dist.

pyxidatum Bremser, in Rud., 1819a, 678, t. h. Crocodilus sclerops; Brazil.—1819: Dist.

pyrula Bory de St. Vincent, 1823a, 355, in infusion de chènevis.—1823: Cerc.

quadrangulata Bosc., 1802a, 257.—1802: Planaria.

quadrangularis Pallas, 1774, 20 in fossis; Hagæ Comitum.—1774: Fasc.

quadricornis Haswell, 1887a, 284, t. h. Astacopsis franklinii; Tasmania.—1887: Temnocephala.

quietum Staff., 1900, 403, t. h. "frog;" apparently Canada.—1900: Dist. 1905: Glypthelmins (type).

rachiæum Crep., 1839, 289, for rhachiæum (Diplost.).

rachidis Par., 1896, 2, for rhachidis.—1896: Diplost. (Tylodelphis).

rachieum Fraip., 1880c, 419, for rhachiæum (Diplost.).

rachineum Mueller, (1842).—Diplost.

rachion Cobbold, 1858b, 158, t. h. Morrhua æglefinus.—1858: Dist. 1886: D.(Echinost.). 1904: Lepidapedon (type). 1905: Lepodora (type).

rachiæa Odhn., 1905, 328, for rachion (Dist.).—1905: Lepodora (type).

radiata Mueller, 1774, 66, in aquis sylvestribus, rara.—1774: Fasc. 1776: Planaria.

rachidis Hanover, 1864a, 3, see rhachidis 1850 (Tylodelphys).

radiatum Duj., 1845a, 427 t. h. Carbo cormoranus or Pelecanus carbo.—1845: Dist. (Echinost.).

radula Duj., 1845a, 433, t. h. Lymnæus palustris; Rennes.—1845: Dist. (Echinost.).

ragazzi Linst., 1903t, 354, for ragazzii (Dist.).

ragazzii Setti, 1897, 8, t. h. Squalus sp.; Eritrea.—1897: Dist. (Polyorchis). 1899: Syncœlium (type).

rajæ Rud., 1809a, 435, for rajæ intestinale.—1809: Dist.

rajæ intestinale Viborg, 1795, 242.—1795: Dist.

ralli Rud., 1819a, 120, t. h. Rallus aquaticus.; M. C. V.—1819: Dist. [1850: D. holostomum.]

ramlianum Looss, 1896b, 36, t. h. caméléon; Ramleh.—1896: Dist. 1899: Lepoderma (type). 1899: Plagiorchis.

ramosum Sons., 1895, 123, t. h. Babulcus ibis: Nile Delta.—1895: Echinost.

ranæ Gmelin, 1790a, 3055, t. h. Rana, int.; Europe.—1790: Fasc. [1809: Amphist. subclavatum.]

ranæ Frœlich, 1791, 69, t. h. Rana temporaria; Europe.—1791: Fasc. [1809: Amphist. subclavatum.] [1850: Dist. clavigerum.] [1894: D. endolobum.]

ranæ Zed., 1800a, xviii, 203, t. h. Rana temporaria; includes Planaria uncinulata 1790, from Rana esculenta; Europe.—1800: Polyst. (type). [1809: P. integerrimum.]

ranæ Valentin, 1843, 90 teste Dies., 1850a, 472.—Trematodum.

ranæ esculentæ Dies., 1850a, 388, based on Valentin, 1841, 54.—1850: Dist.

rarum Ben., 1858a, 1861a, 178, t. h. Cyprinus dobula.—1858: Dist.

rarus Braun, 1901, 17, t. h. Fulica atra, Coll. Berlin; Anas boschas. 1901: Prosthogonimus.

rastellus Olss., 1876, 16, t. h. Rana temporaria.—1876: Dist. [1887: D. endolobum.]

rathonisi Simon, 1896, 182, 192, misprint for rathouisi (Dist.).

rathonisii Huber, 1894, 2, misprint for rathouisi (Dist.).

rathouisi Poir., 1887, 203, t. h. Homo; Asia.—1887: Dist. 1892: D. (Dicrocœlium). 1903: Fasciolopsis.

rathouisii Braun, 1892a, 568, for rathouisi (Dist.).

raynerianum Nardo, 1827, 68, t. h. Luvarus imperialis; Venice.—1827: Dist. 1886: D. (Apoblema). 1901: Accacœlium.

receptaculum Cobbold, 1860a, 29, t. h. Labrax lupus.—1860: Dist.

recurvatum Linst., 1873, 105, t. h. Anas marila.—1873: Dist. 1892: Echinost.

recurvum Duj., 1845a, 410, t. h. Mus sylvaticus; Rennes.—1845: Dist. (Brachylaimus).

redactum Nicoll, 1906, 515, t. h. Gasterosteus aculeatus; Scotland.—1906: Psilost. [1907: Podocotyle atomon.]

reductum Looss, 1901, 562, t. h.Thalassochelys corticata.—1901: Enodiotrema.

refertum Mueh., 1898, 18, t. h. Cypselus apus; East Prussia.—1898: Dist. 1899: Dicrocœlium.

reficiens Braun, 1901, 945, t. h. Falco nitidus.—1901: Dicrocœlium.

[*reflexum:* Schistosoma, a term in teratology.]

reflexum Crep., 1825a, 54, t. h. Cyclopterus lumpus.—1825: Dist. 1886: D. (Dicrocœlium). 1905: Podocotyle.

reinhardi Linst., 1903, 208, t. h. Astacus leptodactylus.—1903: Dist.

renale Chiaje, 1833, 13, t. h. Homo; Naples.—1833: Tetrast. (type).

renale Fil., 1855b, 19, t. h. Helix adspersa; near Turin.—1855: Dist. 1856: Cerc. 1858: C. (Gymnocephala).

renicapite Leidy, 1856, 43, t. h. Sphargis coriacea; America.—1856: Monost.

reniferum Looss, 1898, 461, unicum Looss, not Molin, renamed.—1898: Dist. 1899: Astia (type). 1904: Astiotrema (type).

reniforme Luehe, 1899, 531, for reniferum Looss (Dist).

reniformis Ariola, 1902, 101, t. h. Thynnus vulgaris; Naples.—1902: Didymocystis (type).

repandum Rud., 1819a, 681, t. h. Rana sp.; Brazil.—1819: Dist.

resectus Looss, 1902m, 537, t. h. Chelone mydas; Egyptian coast.—1902: Cricocephalus.

reticulare Ben., 1859, 84, t. h. Chelonia midas.—1859: Monost. 1899: Microscapha (type). 1901: Microscaphidium (type).

reticulata Goto, 1894a, 189, t. h. Stromateus argenteus; Japan.—1894: Microcotyle.

reticulatum Looss, 1885, 427, t. h. Wels; Costa Rica.—1885: Dist. 1899: Clinost. [1888: Mesogonimus (type).]

reticulatum Wright, 1879, 58, t. h. Ceryle alcyon.—1879: Dist. 1899: Fasc. 1892: D. (Brachylaimus.)

reticulatum Poir., 1886, 39, in Axinurus dugesii.—1886: Dist. [1899: Clinost. marginatum.]

retikulatum Looss, 1885b, 59, for reticulatum (Dist.).

retroconstrictum Srámek, 1901, 95, 108, fig. 62, t. h. Abramis brama.—1902: Dist.

retroflexum Mol., 1859, 290, t. h. Belone acus; Batavii.—1859: Dist. 1898: Podocotyle. 1886: D. (Podocotyle).

retusum Duj., 1845a, 405, t. h. Rana temporaria; Rennes.—1845: Dist. (Brachycœlium). 1886: D. (Dicrocœlium).

revoluta Frœlich, 1802, 58, t. h. Anas boschas; Europe.—1802: Fasc. 1899: Echinost.

rhachiæum Henle, 1833a, 19, t. h. Rana.—1833: Diplost. 1892: Tylodelphys.

rhachidis Dies., 1850a, 305, rhachiæum 1833, renamed.—1850: Tylodelphys. 1896: Diplost. (Tylodelphis).

rhatonisii Simon, 1897, 223, misprint for rathouisii (Dist.).

rhizophisæ Mont., 1888a, 199, for rhizophysæ (Dist.).

rhizophysæ Studer, 1878, 12, t. h. Rhizophysa conifera.—1878: Dist.

[*rhodopyge* Sluiter, 1898 (Dist.), a tunicate.]

rhombi Ben., 1870, 72, t. h. Rhombus maximus.—1870: Dist.

rhombi Ben. & Hesse, 1863, 1864, 73, t. h. Rhombus maximus.—1863: Placunella. 1878: Trist. 1903: Trachopus.

rhombi lævis Dies., 1858c, 328, t. h. Rhombus lævis; Europe.—1855: Monost. 1892: Monostomulum.

rhopaloides Crep., 1839, 294, for ropaloides 1836, q. v.—1839: Amphist.

ricchiardii see richiardii (Dist.).—1902: Probolitrema (type).

richardii Brand., 1891b, 267, for richiardii (Dist.).

richiardi Mont., 1891, 500, for richiardii.—1891: Dist. (Polyorchis).

richiardii Lopez, 1888a, 137, t. h. Acanthias vulgaris.—1888: Dist. 1900: Anaporrhutum. 1902: Probolitrema (type).

richiardii Sons., 1890, 172, t. h. Pagrus orphus. -1890: Anoplodiscus (type).

rigens Linst., 1878a, 282, for ligula 1871 (Dist.).

rigonocerca Braun, 1892a, 809,? for trigonocerca.—1892: Cerc.

ringens Rud., 1819a, 101, t. h. Picus tridactylus; Vien. Mus.—1819: Dist. [1850: D. macrostomum.]

ringens Linst., 1878a, 360, for ligula 1871 (Dist.), t. h. Scymnodon ringens.

ringens Lint., 1905, 327, t. h. Micropogon undulatus, Trachinotus carolinus; Beaufort, N. C.—1905: Aspidogaster.

ringeri Cobbold, 1880, Aug., 139, t. h. Homo.—1880: Dist. 1890: Mesogonimus. 1897: Distomi. [See westermanii.]

ringerii for ringeri (Dist.).

ringers Rev. Sci., 1890, v. 46, 189, 190, for ringeri (Dist.).

robustum Lorenz, 1881, 583, t. h. Elephas africanus.—1881: Dist. 1892: D. (Brachylaimus).

robustum Stoss., 1902, 18, t. h. Fuligula cristata.—1902: Cyclocœlum.

robustus Looss, 1901l, 621, t. h. Chelone mydas; Egyptian coast.—1901: Charaxicephalus (type).

rochebruni Poir., 1886, 36, t. h. Delphinus delphis.—1886: Dist. 1892: Cladocœlium. 1899: Brachycladium.

rochebrunni Braun, 1892a, 673, for rochebruni (Dist.).

rombi-lævis Mont., 1892, 717, for rhombi-lævis (Monost.).

ropaloides Leblond, 1836c, 290, t. h. Muræna conger; coast of Normandy.—1836: Amphist. [1850: Tetrabothriorhynchus migratorius.]

rosaceum Nord., 1832, 82, t. h. Gadus lota.—1832: Dist. 1856: D. [tereticolle].

rosarum Cobbold, 1860a, 21, misprint for rosaceum (Dist.).

rosea Mueller, 1774, 58, in sinu Drœbachiensi.—1774: Fasc. 1787: Plan. 1892: Amphiporus.

rosea Ben., 1870, 1871a, 90, t. h. Petromyzon omalii; Belgium.—1870: Dist.

rossittensis Mueh., 1898, 16, t. h. Turdus pilaris; East Prussia.—1898: Urogonimus 1899: Urotocus (type).

[*rostellatum* Dies., 1850a, 603.—1850: Octobothrium, cestode.]

rostrata Mueller, 1774, 65, in paludosis, primo vere annorum.—1774: Fasc. 1776: Plan.

rostrata Erc., 1881, see Par., 1894, 190, ? t. h. Bythinia tentaculata; Bologna.— 1881: Cerc.

rostroaculeata Erc., 1881, see Par., 1894, 164, ? t. h. Bythinia tentaculata; Bologna.— 1881: Cerc. [1894: C. nodulosa.]

rotundatum Linst., 1877, 187, t. h. Lanius collurio.—1877: Holost.

rotundum Goto, 1894a, 245, t. h. Xiphias gladius; Japan.—1894: Trist.

rubellum Olss., 1868, 40, t. h. Labrus maculatus.—1868: Dist. 1886: D. (Brachycœlium). 1899: Lecithodendrium. 1902: Zoogonus.

rubens Duj., 1845a, 411, t. h. Sorex fodiens, S. tetragonurus; Rennes.—1845: Dist. (Brachylaimus).

ruber Luehe, 1900, 507, t. h. Trigla lineata.—1900: Derogenes (type).

ruber see also rubrum (Cricocephalus).

rubra Mueller, 1774, 59, Fucorum frequens.—1774: Fasc. 1776: Plan.

rubrum Kuhl & van Hasselt, 1822a, 1824a, 311, t. h. Chelonia midas; Iles des Cocotiers.—1824: Monost. 1902: Cricocephalus.

[*rubrum* Savigny (Dist.), a tunicate.]

rude Dies., 1850a, 360, t. h. Lutra brasiliensis; Brazil.—1850: Dist. [1899: Paragonimus.] 1900: Paragonimus.

rudectum Braun, 1901, 946, t. h. Ibis cœrulescens; Brazil.—1901: Lyperosomum.

rudolphianum Dies., 1850a, 429, t. h. Orthagoriscus mola; new name for T. coccineum of Rud., Phylline coccinea Schweigger, Capsala sanguinea Blainville, T. molæ Bl.—1850: Trist. 1865: Capsala.

rufoviride Rud., 1819a, 110, t. h. Muræna conger; Naples.—1819: Dist. 1845: D. (Apoblema). 1899: Hemiurus. 1889: Apoblema. 1901: Lecithochirium (type).

rugosus Odhn., 1902, 32, t. h. Coluber pullatus.—1902: Cotylotretus (type).

rutilans Bosc, 1802a, 258.—1802: Plan.

saccata Goeze, 1782a, 221, based on Sack-Egel of Merrem, 1781, 169, pl. 1, figs. 3-7.— 1781: Fasc. [1803: Cysticercus tæniæformis.]

sacidiornicola Stoss., 1902, 34, for sarcidiornicola (Monost.).

saginatum Ratz, 1898, 73, t. h. Ardea alba; Europe.—1898: Dist. 1903: Pegosomum (type).

sagitata Lespés, 1857, 114, t. h. Nassa reticulata; Arcachon.—1857: Cerc. [C. (Gymnocephala).]

sagitta Looss, 1899b, 668, t. h. Chelonia mydas; Egypt.—1899: Microscapha. 1901: Microscaphidium. 1902: Octangium (type).

sagitta Pag., 1862, 297, for sagitata (Cerc.).

sagittalis Vaney & Conté, 1899, 196, C. sagittifera Sieb., 1854, renamed, t. h. Helix pomatia.—1899: Cerc.

sagittata Dies., 1858d, 249, for sagitata 1857.—1858: Cerc. (Gymnocephala).

sagittatum Leuck., 1842, 49, t. h. Salmo fario.—1842: Octobothrium. 1850: Discocotyle (type). 1858: Placoplectanum (type).

sagittatus Dies., 1836, 313, t. h. Esox belone; Europe.—1836: Heteracanthus. [1850: Axine bellones.]

sagittifera Sieb., 1854, 18, t. h. Helix pomatia.—1854: Cerc. [1858: Cercariæum helicis pomatiæ.]

salamandræ Frœlich, 1789, 119, t. h. Salamandra atra.—1789: Fasc. 1803: Dist. [1809: D. crassicolle.]

salamandrinæ perspicillatæ Sons., 1896, 1; 1896, 116.—1896: Dist.

salebrosum Braun, 1901g, 946, t. h. Cypselus melba; Coll. Vien.—1901: Lyperosomum.

salmonis Mueller, 1780 of Gœze, 1782a, 173.—Fasc. [1901: ? Hemiurus crenatus (Rud.) Luche.]

salmonis lavareti Linst., 1878a, 266.—Trematodum.

salpæ Par. & Perugia, 1890, 207, t. h. Box salpa; Genova.—1890: Microcotyle.

sanguicola delle Chiaje, 1833, 14, venarum renamed, t. h. Homo.—1833: Polyst.

sanguinea Blainv., see Dies., 1850a, 429.—Capsala. [1850: Trist. rudolphianum.]

sanguineum delle Chiaje, 1837b, 245, t. h. Homo.—1837: Polyst.

sanguineum Sons., 1894, 111, t. h. Camæleo vulgaris; Gabes in Tunisia.—1894: Dist. 1895: D. (Brachylaimus). 1899: Anchitrema (type).

sarcidiornicola Mégnin, 1890c, 87, t. h. Sarcidiornis melanota; Madagascar.—1890: Monost. 1902: Typhlocœlum.

sargi and *sargii* Par. & Per., 1890, 4, t. h. Sargus rondeletii; Genova.—1890: Microcotyle.

sauromates Poir., 1886, 24, t. h. Elaphis sauromates.—1886: Dist. 1895: D. (Dicrocœlium). 1904: Plagiorchis.

sauromatis Braun, 1893a, 876, for sauromates (Dist.).

sawakinensis Looss, 1899b, 672, t. h. Larus sp.; Sawakin, Egypt. 1899: Stictodora (type).

scaber Rud., 1819a, of Odhn., 1905, 353.—1905: Dist. [1905: Stephanochasmus.]

scabra Mueller, 1788, 31, t. h. Gadus barbatus.—1788: Fasc. 1803: Dist. 1889: Apoblema. 1899: D. (Hemiurus) scabrum.

scabridum Braun, 1900, 390, t. h. Noctilio macropus, Molossus, Phyllostoma; Brazil.—1900: Urotrema (type).

scabrum of Rud., 1819a, 424.—1819: Dist. (Echinost.). 1860: Echinost. 1899: Anoiktost. [1899: Stephanost.] [1905: Stephanochasmus.]

schistocotyle Fischder., 1901, 373, t. h. Dicotyles torquatus; Brazil.—1901: Cladorchis (Taxorchis, type).

schistolotyle Fischder., 1903f, 607, for schistocotyle (Cladorchis).

schlosseri Graff, 1904, 457, t. h. Botryllus schlosseri.—1904: Plan.

sciænæ Ben. & Hesse, 1863, 123, t. h. Sciæna aquila.—1863: Diplectanum.

sciænæ P. J. Ben., 1856, 502, t. h. Sciæna aquila.—1856: Epibdella. 1891: Phylline. 1903: E. (Benedenia). [1878: Trist.] [1858: Benedenia elegans, type.]

sciænæ Goto, 1894a, 194, t. h. Sciæna scina; Japan.—1894: Microcotyle.

sciænæ Ben. & Hesse, 1863, 1864, 93, t. h. Sciæna aquila.—1863: Udonella.

sciænæ Tasch., 1878, 568, for sciænæ Ben., 1856.—1878: Trist.

scimna Risso, 1826, 262, t. h. Echinorhinus spinosus.—1826: Dist. [1850: D. insigne.]

scionæ Ben. & Hesse, 1864, 123, for sciænæ (Diplectanum).

scionæ Ben. & Hesse, 1864, 69, for sciænæ (Epibdella).

scleroporum Crep., 1844a, 112, t. h. Chelonia mydas; Vratislaviæ.—1844: Amphist.

scoliocœlium Fischder., 1904, 459, t. h. Buffelus indicus in Cochinchina and Annam; Bos taurus in Annam.—1904: Paramphist.

scombri Kuhn., 1829b, 361, t. h. Scomber scomber.—1829: Octost. 1832: Octobothrium. 1864: Octocotyle.

scombri Tasch., 1879, 612, t. h. Scomber colias; Naples.—1879: Didymozoon.

scombri of Grube, 1855a, 137, t. h. Scomber scombrus.—1855: Octobothrium. 1855: Tetracotyle. [1858: Grubea cochlear, type.] 1859: Pleurocotyle (type). [1859: Pleurocotylus, type.] 1864: Grubea.

scombri pelamidis Tilesius in Rud., 1809a, 437.—1809: Fasc. [1809: Dist. clavatum.]

scombrinum Linst., 1889, 80, for sobrinum (Dist.).

scorpænæ Rud., 1819a, 122, t. h. Scorpæna scrofa; C. E. V.– 1819: Dist. 1886: D. (Dicrocœlium). 1899: Dicrocœlium. [1899: Creadiinæ.]

scorpii Mueller, 1776, 223, t. h. Cottus scorpius.—1776: Fasc. 1803: Dist. [1850: D. granulum.]

scymna Villot, 1878, 3, for scimna (Dist.).

scymni Mont., 1893, 52, for scimna (Dist.).

scymni ainosi Dies., 1858e, 371, t. h. Scymnus ainosi.—[1857: Polyst. sp.] 1858: Polyst. 1858: Onchocotyle.

scyphocephalum Braun, 1899, 630, t. h. Testudo matemata; Brazil.—1899: Dist. 1901: Acanthochasmus.

sebastis Goto, 1894a, 187, t. h. Sebastes sp.; Japan.—1894: Microcotyle.

secunda Ssinitzin, 1905, 153; 1906, 687, t. h. Corethra, Ephemera; Warschau.—1905: Cerc.

secundum Nicoll, 1906, 514, t. h. Hæmatopus ostralegus, Larus argentatus, L. ridibundus.—1906: Echinost.

secundus Looss, 1907, 134, t. h. mule; Assam.—1907: Gastrodiscus.

segmentatum Mueller, 1894, July, 113.– 1894: Dist. (Echinost.).

semiarmatum Mol., 1858, 131, t. h. Acipenser naccari; Patavii.– 1858: Dist. 1886: D. (Echinost.).

semiflavum Linst., 1880, 50, t. h. Petromyzon fluviatilis.—1880: Dist.

semifuscum Olss., 1876, 28, t. h. Sula bassana; Lund.– 1876: Monost.

semisquamosum Braun, 1900, 228, t. h. Vesperugo noctula.– 1900: Dist. [1907: Parabascus.]

semperi Weber, 1889.—Temnocephala.

semperii Mont., 1891, 129, for semperi (Temnocephala).

sepiolæ delle Chiaje, —.—: Monost.

seriale Rud., 1808a, 351; 1809a, 368, t. h. Salmo alpinus; Greenland.—1808: Dist.

serialis Looss, 1901, 620, t. h. Thalassochelys corticata; Alexandria, from Egyptian coast.—1901: Adenogaster (type).

serotinus Staff., 1904, 493, t. h. Moxostoma macrolepidotum Le S.; Canada.—1904: Plagioporus (type).

serpens Nitzsch, in Rud., 1819a, 88, t. h. Falco haliaëtos; Halle.—1819: Amphist. 1819: Holost.

serpentatum Mol. 1859, 830, t. h. Sayris camperi; Batavii.– 1859: Dist. 1896: D. (Brachylaimus).

serpentulum Carus, 1884, 131, for serpentatum (Dist.).

serrani Mont., 1889, 322, t. h. Serranus fimbriatus, at Madeira, and S. gigas at Naples.—1889: Didymozoon.

serrata Frœlich, 1789, 148 [an Arachnoid], t. h. hares.– 1789: Linguatula (type). 1800: Polyst. 1809: Polyst. (Pentast.). 1819: Pentast.

serrata Looss, 1899b, 592, t. h. Varanus niloticus; Zool. Inst. Leipzig.—1899: Styphlodora (type).

serratum Dies., 1850a, 385, t. h. Aranus scolopaceus; Brazil.—1850: Dist. 1860: Echinost.

serrulata Mueller, 1776.– Fasc. [1901: ? Hemiurus crenatus.]

sessilis Odhn., 1902, 27, t. h. Nilkrokodil.—1902: Nephrocephalus (type).

sessilis Goto, 1894a, 212, t. h. Chœrops japonicus; Mitsugahama (Prov. Iyo, Japan).—1894: Diclidophora. 1895: Cyclobothrium (type).

setifera O. F. Mueller, 1786, 127, in aqua marina raro.—1786: Cerc. [1827: Trichoda.]

setifera Moul., 1856a, 214 and Dies. 1858d, 250 based on J. Mueller, 1850, 497, free in water; Marseille or Triest.—1856: Cerc. 1858: C. (Gymnocephala).

setifera Mueller of Villot, 1879 (Cerc.), in Scrobicularia tenuis. See villoti (Cerc.).

setigera Giard, 1897c, 955, for setifera, 1850.—1897: Cerc.

setosicauda Dadai, 1888f, 84.—1888: Histrionella.

setosicaudata Mont., 1888, 77, for setosicauda (Histrionella).

settenii Numan, 1840, 358, t. h. Equus caballus.—1840: Monost. 1850: Pentast. [1891: Oestrid larva.] 1892: Monostomulum.

sialidis Linst., 1892, 334, t. h. Sialis lutaria.—1892: Dist.

siamense Poir., 1886, 327, t. h. Crocodilus siamensis.—1886: Diplost.

sibiricum Winnogradow, 1892, 116, t. h. Homo; Siberia.—1892: Dist. [Opisthorchis felineus.]

siemersii Buettel-Reepen, 1900, 589, t. h. Sphyræna barracuda; Atlantic.—1900: Dist.

[*sigmoidea* (Nitzschia), a diatom.]

sigmoideus Looss, 1899b, 608, t. h. Passer dom. at Alexandria, Caprimulgus europæus, at Cairo.—1899: Phaneropsolus (type).

signatum Duj., 1845a, 415, t. h. Coluber natrix; Rennes.—1845: Dist. (Brachylaimus).

signatum Duj., of Erc., 1881e, 73, in Tropidonotus natrix.—1881: Dist. 1899: Telorchis. [1893: D. ercolanii.]

siluri Wagener, 1857, see Braun, 1890a, 544.—Dactylogyrus.

siluri glanidis Wagener, 1857, see Dies., 1858e, 379.—Dactylogyrus.

simile Sons., 1890, 105, t. h. Python molurus.—1890: Dist.

simile Jægers., 1900, 737, see pygmæa similis.—[1900: Levinsenia pygmæa var.] 1902: Spelotrema.

simile Looss, 1899b, 601, see similigenus.—1899: Dist. 1899: Hæmatolœchus. 1902: Pneumonœces.

similigenus Stiles & Hass., 1902d, 20, for simile (Dist.) Looss, (Hæmatolœchus).

simuliplexus Staff., 1902, 901, t. h. American frogs and toads.—1902: Hæmatolœchus. 1905: Pneumonœces.

similis Stoss., 1902, 24, t. h. Himantopus atropterus; Egypt.—1902: Hæmatotrephus.

simillimum Mueh., 1898, 18, t. h. Fuligula nyroca.—1898: Dist. 1899: Psilost.

simplex Odhn., 1900, 62, t. h. Pleuronectes limanda; Kristineberg, Sweden.—1900: Aporocotyle (type).

simplex Rud., 1809a, 370 (æglefini Mueller, 1776, renamed), t. h. Gadus æglefinus.—1809: Dist. 1886: D. (Dicrocœlium). 1904: Sinistroporus (type).

simplex Polonio, 1859, teste Par., 1894, 147, t. h. Lacerta muralis; Padua.—1859: Dist.

simplex Looss, 1899b, 606,607, D. cygnoides var. B. of Bensley, 1892, renamed.—1899: Gorgodera. 1902: Gorgoderina (type).

simplex Johnston, 1904, 112, t. h. Ardea novæ hollandiæ Lath.—1904: Holost.

simplissima Curtis, 1900a, 447.—1900: Planaria.

simulans Looss, 1896b, 52, t. h. Pernis apivorus; Alexandria, Egypt.—1896: Dist. 1898: Opisthorchis.

simulans poturzycensis Kowal., 1898g, 71 or 1898h, 135, t. h. Anas boschas dom.—1898: Opisthorchis. 1898: Campula.

sinense Cobbold, 1875i, 423, t. h. Homo; China.—1875: Dist. 1895: Opisthorchis. 1896: Dicrocœlium. 1907: Clonorchis (type).

sinese Mosler & Peiper, 1894, 177 for sinense (Dist.).

sineuse MacConnell, 1876, 343, misprint for sinense (Dist.).

singulare Mol., 1859, 288, t. h. Ibis falcinellus; Patavii.- 1859: Dist. 1899: of Looss, Stomylus (type). 1892: D. (Dicrocœlium). [1900: of Looss, Stomylotrema, type.]

singulare Keferstein, 1862a, 131, t. h. Capitella rubicunda; St. Vaast.- 1862: Loxosoma (type).

singularis Stoss., 1902, 29, t. h. Gallinula pusilla; loc. not given.- 1902: Ophthalmophagus.

singularis Mol. of Looss, 1899b, renamed perpastum Braun.—1899: Stomylus (type). [1900: Stomylotrema, type.]

sinuatum Goto, 1894a, 239, t. h. Histiophorus sp.; Japan.—1894: Trist.

sinuatum Rud., 1819a, 97, t. h. Ophidium imberbe; Naples.—1819: Dist. 1901: Allocreadium. 1902: Helicometra.

sinuatuun Mont., 1899, 109, misprint for sinuatuum 1894 (Trist.).

siredonis Poir., 1886, 32, t. h. Siredon mexicanus, int.—1886: Dist. 1899: Opisthioglyphe.

sirenis Braun, 1893a, 870, for sirenis lacertinæ (Dist.).

sirenis lacertinæ Vaillant, 1863, 348, t. h. Siren lacertina.—1863: Dist.

sluiteri Brock, 1886, 543, t. h. Diacope metallicus; Java.—1886: Eurycœlum (type). 1892: Dist. 1892: Apoblema. 1899: Hemiurus.

smaris Ijima, in Goto, 1894a, 207, t. h. Smaris vulgaris (on caudal segment of a Cymothoa); Gulf of Naples.—1894: Octobothrium. 1894: Diclidophora.

sobrinum Levin., 1881a, 70, t. h. Cottus scorpius; Egedesminde.—1881: Dist. 1886: D. (Echinost.). 1899: Stephanost. 1899: Anoiktost. 1904: Stephanochasmus.

soccus Mol., 1858, 129, t. h. Mustelus plebejus; Patavii.—1858: Dist. 1886: D. (Brachylaimus). [1899: D. megastomum.]

sociale Luehe, 1901, 171, t. h. Bufo melanostictus Schneider; India.—1901: Dist.

soleæ Ben. & Hesse, 1863; 1864, 70, t. h. Solea vulgaris.—1863: Phyllonella (type). 1890: Epibdella. 1903: Phylline. 1879: Trist. (Phylonella). 1878: Trist.

soleæ Duj., 1845a, 417, t. h. Pleuronectes solea; Rennes.—1845: Dist. (Brachylaimus).

soleæforme Rud., 1809a, 384, t. h. Trigla gurnardus; for D. triglæ gurnardi.—1809: Dist. 1828: Fasc.

soleare Braun, 1899e, 629, t. h. Testudo midas.—1899: Dist. 1901: Cymatocarpus.

solidus Looss, 1901l, 619, t. h. Chelone mydas; Egypt.—1901: Glyphicephalus (type).

solitaria Looss, 1899b, 592, t. h. Thalassochelys corticata; Abukir.—1899: Styphlodora. 1903: Renifer.

solivagus Odhn., 1902, 29, t. h. Clemmys caspica.—1902: Telorchis.

solœiformis Blainv., 1828, 585, for soleæforme Rud., 1809a, 384.—1828: Fasc.

somateriæ Levin., 1881, 71, t. h. Somateria mollissima; Egedesminde.—1881: Dist. 1892: D. (Brachycœlium). 1899: Lecithodendrium. 1900: Gymnophallus. 1902: Levcithodendrium. 1904: Leucithodendrium.

sonsinoi Giard, 1880a, lxviii.—Linst., 1889, 23, for sonsinoii 1877 (Gastrodiscus).—1889: Amphist.

sonsinoii Cobbold, 1877e, Apr., 233, t. h. Equus; Egypt.—1877: Gastrodiscus (type). 1877: Aspidocotylus. [1889: Amphist. sonsinoi.] [1896: Gastrodiscus ægyptiacus.]

sonsinoni Poir., 1883, 74, for sonsinoii (Gastrodiscus).

sonsinonis Cobbold, 1879b, 359, for sonsinoii (Gastrodiscus).

sophiæ Stoss., 1886, 44, t. h. Pagellus mormyrus; Triest.—1886: Dist. 1886: D. (Echinost.). [1899: Creadiinæ, ?Creadium.]

sorbens Braun, 1899g, 490, t. h. Tantalus loculator; Brazil.—1899: Clinost.

soricis Dies., 1858e, 354, t. h. Sorex araneus.—1858: Dist. [1855: D. (Dicrocœlium).]

soricis Linst., 1877, 191, t. h. Sorex vulgaris.—1877: Tetracotyle.

soricis aranei Dies., 1855, 64; see soricis.—1855: Dist. (Dicrocœlium).

spari Rud., 1819a, 122, t. h. Sparus erythrinus, S. smaris; C. E. V.—1819: Dist.

spataceum Stoss., 1896, 126, for spathaceum (Diplost.).

spathaceum Rud., 1819a, 109, t. h. Larus glaucus; Mus. Vien.—1819: Dist. 1845: Holost. 1850: Hemist. 1876: Diplost. 1898: Conchosomum.

spathula Brand., 1888a, 54, t. h. Falco palumbarius; Vienna Museum.—1888: Diplost. 1888: Hemist.

spathula Crep., 1829, 50, t. h. Falco buteo, F. nisus, F. lagopus.—1829: Holost. 1850: Hemist. [1898: Conchosoma.]

spathulæforme Brand., 1888a, 44, t. h. Strix otus.—1888: Diplost.

spathulatum Leuck., 1876, 871, not Crep., 1849, t. h. Homo; for spatulatum Rud., 1819.—1876: Dist. [Opisthorchis sinensis.]

spathulatum Rud. of Crep., 1837, 310, for spatulatum.—1837: Dist. 1898: Echinost. 1902: D. (Echinost.). 1902: Sodalis (type).

spathulatum Dies., 1859c, 426, for spatulatum (Monost.).

spathulatum hepatis Simmonds, 1901, 110, see sinense (Dist.).

spatiosus Brand., 1898a, 197, t. h. Bos taurus; Dschidda, Arabia.—1898: Gastrothylax.

spatula Duj., 1845a, 394, t. h. Accentor modularis, int.; Rennes.—1845: Dist. (Dicrocœlium).

spatula Sieb., 1835, 57, for spathula Crep., 1829.—1836: Holost. 1898: Conchosomum.

spatula Odhn., 1902, 66, t. h. Bagrus docmac, B. bayad; Sudan.—1902: Phyllodist. 1902: Catoptroides (type).

spatulæforme Odhn., 1902, 67, t. h. Malapterurus electricus; Africa.—1902: Phyllodist. 1902: Catoptroides.

spatulatum Cobbold, 1879, 28, for spathulatum Leuck., 1876, 871; not spatulatum Rud., 1819.—1879: Dist. [Clonorchis sinensis.]

spatulatum Leidy, 1859, 111, t. h. a fish; America.—1859: Monost.

spatulatum Rud., 1819a, 109, t. h. Ardea minuta; Vien. Mus.—1819: Dist. 1845: Holost. 1902: Sodalis (type) spathulatus. 1898: Echinost. [spathulatum].

speciosus Stiles & Hass., 1896, 151, D. longissimum corvinum, 1894, renamed because of D. corvinæ, 1886; but corvinæ should not invalidate corvinum.—1896: Opisthorchis.

spenceri Haswell, 1893c, 97, t. h. Astacopsis bicarinatus; Australia.—1893: Craspedella (type).

spermatica Blumberg, see Chiaje, 1833, 34.— : Cerc.

sphæricus Klein, 1905, 68, t. h. Rana hexadactyla.—1905: Pleurogenes.

sphærocephalum Westrumb, 1823, 396, t. h. Coracias jugularis; Rio de Janeiro, Brazil.—1823: Amphist. 1850: Holost.

sphærostomum Schlotthauber, 1860, 130, t. h. Corvus caryocatactes.—1860: Dist.

sphærula Looss, 1896b, 81, t. h. Rhinolophus hippocrepis Bonap.; Ghizeh.—1896: Dist. 1899: Lecithodendrium.

sphærula Rud., 1803a, 23, t. h. Corvus cornix; Greifswald.—1803: Amphist. 1845: Holost.

sphyra Braun, 1890a, 544, for sphyrna (Dactylogyrus).

sphyræna Tasch., 1879, 612, t. h. Sphyræna vulgaris; Naples.—1879: Didymozoon.

sphyrna Linst., 1878, 229, t. h. Abramis vimba; middle Europe.—1878: Dactylogyrus.

spiculator Duj., 1845a, 424, t. h. Mus decumanus; Rennes.—1845: Dist. (Echinost.). 1860: Echinost.

spiculigerum Muehling, 1898, 18, t. h. Fuligula nyroca.—1898: Dist. 1899: Psilost.

spinacis Goto, 1894a, 224, t. h. Spinax sp.: at Odawara, Japan.—1894: Onchocotyle. 1899: Squalonchocotyle.

spindalis Montgomery, 1906, 147, t. h. Bos indicus; India.—1906: Schistosoma.

spinetum Braun, 1901, 563, t. h. Rhynchops nigra L.; Brazil.—1901: Microlistrum.

spiniceps Looss, 1896b, 114, t. h. Bagrus bayad; Cairo, Egypt.—1896: Dist. 1899: Anoiktost. 1899: Acanthost. (type). 1901: Acanthochasmus (type).

spinifera La Valette, 1855, 17, t. h. Paludina vivipara, Planorbis corneus.—1855: Cerc. 1858: C. (Nephrocephala).

spiniferum Ratz, 1903, 422, t. h. Botaurus stellaris; Hungary.—1903: Pegasomum.

spinosissimum Stoss., 1883, 112, t. h. Box salpa; Triest.—1883: Monost. 1901: Centroderma (type).

spinosum Linst., 1880, 51, t. h. Sylvia rufa.—1880: Dist. 1892: D. (Dicrocœlium). [1899: ?D. cirratum.]

spinulosum Rud., 1808a, 458; 1809a, 425, t. h. Larus nævius, L. cinerarius, Colymbus septentrionalis; Greifswald.—1809: Dist. (Echinost.). 1858: Echinost.

spinulosum Hofmann, 1899a, 184.—1899: Dist. 1899: Harmost.

spinulosum Hofmann, 1899a, 178, of pulmonates.—1899: Cercariæum. [1899: Dist. spinulosum.]

spinulosum Looss, 1901l, 623, t. h. Chelone mydas; Alexandria, Egypt, from Egyptian coast.—1901: Amphist.

spirale Dies., 1850a, 325, t. h. Hypsilophus tuberculatus, Podocnemis tracaxa, Chelonsidis tuberculatus; Brazil.—1850: Monost. 1892: Dist.

spirale Fil., teste Par., 1896, 2, t. h. Dentex vulgaris.—Dist.

squali E. Bl., 1847, 327, t. h. Squalus; New Zealand.—1847: Trist. [1850: T. blanchardii.]

squali grisei Risso, ——, 38, see Dies., 1850a, 347.—Fasc. [1850: Dist. veliporum.]

squamata Kerbert, 1881a, 556, for squamula (Dist.).

squamatum Linst., 1906, 174, t. h. Dissura episcopus; Palatupana.—1906: Lyperosomum.

squamatus Odhn., 1905, 297 (armatum Mol. of Olss.), t. h. Cottus scorpius; Belgium.—1905: Prosorhynchus (type).

squamosum Villot, 1878, 20, t. h. Strepsilas interpres.—1878: Holost. 1890: Dist.

squamula Rud., 1819a, 103, t. h. Mustela putorius; Mus. Vien.—1819: Dist. 1845: D. (Eurysoma [type]). 1850: Monost. 1892: D. (Dicrocœlium). 1898: Eurysoma (type).

squamula Heath, 1902, 109, t. h. Paralichthys californicus.—1902: Epibdella. 1903: Phylline. 1905: E. (Phylline).

squatinæ Ben., 1865a, 11, t. h. Squatina angelus; Ostend, Belgium.—1865: Pseudocotyle (type).

squillarum Par. & Per., 1889, 76, t. h. Bopyrus squillarum; Triest.—1889: Mescocotyle (type). 1898: Dactylocotyle. 1895: Octobothrium. [1898: Dactylocotyle merlangi.]

stagnalis Mueller, 1774, 53, in stagnis.—1774: Fasc. 1776: Planaria.

stanleyi Cobbold, 1879b, 357, for stanleyii (Amphist.).—1879: Amphist. collinsii.

stanleyii Cobbold, 1875n, 819, t. h. Equus caballus; India.—1875: Amphist.

steenstrupi Odhn., 1902, 68, t. h. Anarrhichas minor s. pantherinus; Coll. Copenhagen.—1902: Lepidophyllum (type).

stenocotyle Cohn, 1902, 880, t. h. Herpetodryas fuscus; South America.—1902: Leptophyllum (type).

stentomi Goto, 1899a, 279, t. h. Stenotomus chrysops; Newport, R. I.—1899: Microcotyle.

sternæ cantiacæ Dies., 1858, 355, t. h. Sterna cantiaca; based on LaValette and Moul., 1856, 102.—1858: Dist.

stossichi Mont., 1893, 87, for stossichii (Apoblema).—1899: Hemiurus.

stossichi Luehe, 1901 of Odhn., for stossichii.—1905: Hemiurus. [1905: H. lühei.]

stossichi Braun, 1899, 80, t. h. Mustelus lævis.—1899: Calicotyle.

stossichianum Mont., 1892, 12, t. h. Box salpa; Italy.—1892: Monost.

stossichii Mont., 1891, 512, t. h. Clupea aurita, C. pilchardus.—1891: Apoblema. 1893: Dist. 1899: Hemiurus. 1907: Aphanurus, type.

strephocœlium Fischder., 1902a, 19, for streptocœlium (Paramphist.).

streptocœlium Fischder., 1901, 369, t. h. Bos kerabau; Ceylon.—1901: Paramphist.

striata Herbst, 1787a, 34.—1787: Planaria.

striata Par. & Perugia, 1890, 7, 21, t. h. Lichia amia; Triest.—1890: Vallisia (type). 1890: Octocotyle. [Octobothrium arcuatum].

striatum Rud., 1809a, 343, t. h. Falco milvus; Europe.—1809: Amphist. [1819: A. macrocephalum.] [1850: Hemist. spathula.]

stridulæ Reich, 1801, 371, t. h. Strix stridula.—1801: Bist. 1801: Dist. [1809: D. apiculatum.]

strigata Mueller, 1774, 66, in aquis paludosis.—1774: Fasc. 1776: Planaria.

strigis Schrank, 1788a, 16, t. h. Weideneule.—1788: Festuc. 1790: Fasc. [Planaria.] 1790: Strigea, type. [1801: Amphist., type.] [1809: Amphist. macrocephalum, type.] [1850: Holost. variabile.]

strigis stridulæ Braun in Rud., 1809a, 347.—1809: Fasc.

strigosum Looss, 1899, 634, t. h. Merops apiaster; Marg.—1899: Dicrocœlium. 1899: Lyperosomum.

sturionis Rud., 1809a, 435, t. h. Acipenser sturio; Arimini.—1809: Dist. [——: D. hispidum.]

sturionis Abildg., 1794b, 55, t. h. Stören.—1794: Hirudo. ——: Trist. [1850: Nitzschia elegans.] 1852–53: Nitzschia. [1878: T. elongatum.]

stylosa Linst., 1875, 193, t. h. Planorbis vortex.—1875: Cerc.

subclavata [Pallas, 1760, 29;] Gœze, 1782a, 178, t. h. Rana; Germany.—[1760: Fasc.] 1782: Planaria. 1788: Fasc. 1800: Dist. 1802: Amphist. 1836: Diplodiscus (type). [1850: Diplocotyle.]

subclavata ore sessile Pallas, 1760, or 1761, 271, t. h. Rana.—1760: Fasc.

subelavatum Sons., 1893, 187, for subclavatum (Amphist.).

subflavum Sons., 1892, 91, t. h. Zamenis viridiflavus.—1892: Dist. 1895: D. (Brachylaimus).

[*subtilis* (Nitzschia), a diatom.]

subtriquetrum Rud., 1814a, 100, t. h. Castor fiber; Berlin, Germany.—1814: Amphist. 1840: Dist. 1901: Cladorchis (Stichorchis). 1902: Stichorchis.

subtriquetrum giganteum Kuech., 1855, 192 (?for subtriquetrum, giganteum).—1855: Amphist.

subulata Herbst, 1787a, 36.—1787 Planaria.

subulo Pag., 1857, 19, t. h. Paludina vivipara—1857: Cerc. 1858: C. (Acanthocephala).

suis Stiles, 1898a, 22, musculorum suis Duncker, 1896, named binominally; t. h. Sus scrofa dom.; Germany.—1898: Agamodist.

sulcatum Linst., 1883, 309, t. h. Perdix græca; Turkestan.—1883: Dist. 1892: Cladocœlium.

sulcatum Rud., 1809a, 337, t. h. Rana pipa, intestine.—1809: Monost. (Monost.).

superbum Staff., 1904, 492, t. h. Ameiurus nebulosus, Perca flavescens; Canada.—1904: Phyllodist.

suspensum Braun, 1901, 948, t. h. Corvus sp.—1901: Dist.

syamula, see squamula.

sygnoides Nord., 1840, 617, for cygnoides (Dist.).

sylviæ Rud., 1819a, 675, t. h. Sylvia cyanea; Brazil.—1819: Amphist.

synethes Fischder., 1901, 371, t. h. Bos kerabau; Ceylon.—1901: Gastrothylax.

syrinus Kuech., 1855, 471, misprint for gyrinus (Cerc.).

tabulatum Mueller, 1897, 21, in Numenius arquatus.—1897: Echinost.

tacapense Sons., 1894, 111; 1894, 2, t. h. Chamæleo vulgaris, Rana esculenta, Bufo sp.; Gabes in Tunis.—1894: Dist. (Brachycœlium). 1899: Pleurogenes. [1899: D. medians Olss.]

tadornæ Rud., 1819a, 89, for anatis tadornæ, syn. of isostomum.—1819: Amphist.

tænioidea Nord., 1840, 595, for tænioides (Polyst.).

tænioides Rud., 1809a, 441, t. h. Canis familiaris; France.—1809: Polyst. (Pentast.). 1819: Pentast. 1819: Prionoderma. [1824: prionoderme (type).] 1789: Linguatula, type.]

tænioides Mont., 1888a, 93, t. h. Orthagoriscus mola.—1888: Didymozoon. 1904: Nematobothrium (Didymozoon).

tagax Braun, 1901g, 896, t. h. Hirundo versicolor; Brazil.—1901: Stomylotrema.

talpæ Viborg, 1795, 242.—1795: Dist.

talpæ cæcæ Dies., 1850a, 472.—1850: Trematodum.

tanagræ Rud., 1819a, 674, t. h. Tanagra tatoa; Brazil.—1819: Amphist.

tarda Steenstrup, 1842, 75, Cerc. armata Siebold, renamed.- 1842: Dist. [1858: Tetracotyle typica.]

tardigrada Dies., 1850a, 293, D. duplicatum, renamed.- 1850: Rhopalocerca (type).

tartinii Stoss., 1899, 6, t. h. Oblata melanura; Triest.- 1899: Dist.

taschenbergi Par., 1894, 704, for taschenbergii (Dactylocotyle).

taschenbergi Par. & Per., see St. Remy, 1898, 555.—Diclodophora.

taschenbergii Par. & Perugia, 1889, 743, t. h. Sargus rondeletii; Genova.—1889: Choricotyle. 1890: Octobothrium. 1894: Dactylocotyle (Choricotyle).

tasmanica Haswell, 1900, 430, t. h. Astacopsis tasmanicus.—1900: Temnocephala.

tectum Linst., 1873, 104, t. h. Osmerus eperlanus.—1873: Dist. [1905: Brachyphallus crenatus, type.]

tellinæ baltica Dies., 1850a, 298, t. h. Tellina baltica; Gedani.- 1850: Cerc. 1855: Cercariæum.

temperatus Staff., 1905, 689, t. h. Rana catesbiana, R. virescens; Canada.—1905: Diplodiscus.

tenax Mueller, 1773, 69, in infusione sordium dentium intra quatriduum.—1773: Cerc. 1827: Phacus.

tener Kowal., 1903, 517, t. h. Mergus merganser.—1903: Metorchis.

tenere Looss, 1898, 458, D. tacapense Sonsino of Looss renamed.—1898: Dist. 1898: Pleurogenes. 1899: Prosotocus. 1899: D. (Pleurogenes).

tenerum Looss, 1899b, 616, 622, see tenere (Dist.).

tensum Looss, 1902h, 141, t. h. Mugil chelo; Triest.—1902: Saccocœlium.

tentaculata Mueller, 1774, 63, in aquis palustribus.—1774: Fasc. 1776: Planaria.

tenue Lint., 1898, 535, t. h. Roccus lineatus.—1898: Dist.

tenue tenuissime Lint., 1898, 536, t. h. Morone americana.—1898: Dist.

tenuicolle Rud., 1819a, 93, t. h. Phoca barbata.—1819: Dist. 1892: D. (Brachylaimus). 1896: Opisthorchis.

tenuicolle Rud., 1819a, 85, t. h. Lampris guttatus; Groningæ.- 1819: Monost. (Monost.) [1850: Dist. affine Dies. nec Rud.].

tenuicolle Westrumb, 1823, 391, t. h. Falco rufus; [Mus. Cat. Vien.].- 1823: Amphist. 1850: Holost.

tenuicollis-felineus Looss, 1899, 678, see tenuicollis.—1899: Opisthorchis.

[*tenuis* Muenster, 1842, 99.—Hirudinella. Hirudella, a leach.]

tenuis Wedl, 1857, 258, t. h. Perca fluviatilis.—1857: Gyrodactylus. 1858: Dactylogyrus.

tenuissime Lint., 1898, 536, t. h. Morone americana.—1901: Dist. [1898: D. tenue.]

teres Gœze, 1782a, 173.—1782: Planaria.

teres duplici poro Gœze, 1782a, 173.—1782: Planaria.

teres poro simplici Gœze, 1782a, 173.—1782: Planaria.

tereticolle lucii Mayer, 1841, 18.—1841: Distoma.

tereticolle rosaceum (Nordmann, 1832) Dies., 1850a, 364.—1850: Dist.

tereticollis Rud., 1802, 74–75, lucii Mueller renamed.—1802: Fasc. 1808: Dist. 1845: Dist. (Brachylaimus). 1899: Azygia (type). 1904: Azigia.

teretiusculum Mont., 1893, 40, t. h. Solea klenii.—1893: Dist.

tergestinum Stoss., 1889, 28, t. h. Oblata melanura; Triest.- 1889: Dist.

tergestinum Stoss., 1883, 119, t. h. Gobius niger, G. jozo; Triest.—1883: Gasterost.

terrestris Mueller, 1774, 68, in asseribus muscisque humidis.- 1774: Fasc. 1776: Planaria. [Rhynchodesmus.]

terrestris Linst., 1889c, 241, t. h. Helix lens; Greece.—1889: Cerc.

terricola Linst. 1889c, 241, t. h. Helix ?vermiculata; Algiers. –1889: Cerc.

testudinis Rud., 1819a, 121, t. h. Testudo orbicularis; C. E. V.—1819: Dist. [1850: Monost. delicatulum.]

testudinis Braun, 1899, 630, MS. name in Vienna Coll. –1899: Monost. [1899: Dist. scyphocephalum.]

testudinis midæ Braun, 1899, 629, for t. mydæ (Dist.).

testudinis mydæ Rud., 1809a, 433, for D. intestinalis testudinis mydæ.—1809: Dist.

tethyæ Mont., 1892, 717.—1892: Monost.

tetracystis Gastaldi, 1854, 4, t. h. Rana esculenta.—1854: Dist. 1905: Cystagora (type).

tetracystis ranæ esculentæ Dies., 1855, 64; see tetracystis.- 1855: Dist.

tetragona Mueller, 1774, 69, in stagno ac foveis aquæ purioris nec vulgaris.—1774: Fasc. 1776: Planaria.

tetrodonis Goto, 1894a, 213, t. h. Tetrodon sp.; Hagi, Japan.- 1894: Diclidophora. 1896: Heterobothrium (type).

tetrodontis St. Remy, 1898, 554, for tetrodonis (Diclidophora) (Heterobothrium).

texanicum Francis, 1891c, 135, t. h. Bos taurus; Texas.—1891: Dist. [Fasc.] [Fasc. magna.]

texicanum Leuck., 1892b, 797, for texanicum (Dist.).

thaumanthiadis Braun, 1889a, 357, for thaumantiatis (Cerc.).

thaumantiadis Pag., 1862, 298, for thaumantiatis (Cerc.).

thaumantiatis Græffe, 1860a, 49, t. h. Thaumantias.—1860: Cerc.

thethydis delle Chiaje, teste E. Bl., 1847a, 309.—Monost.

thetidicola Otto, 1823, 294, t. h. Thetis fimbria.—1823: Vertumnus (type). [1823: Phœnicurus varius.]

thetycola (delle Chiaje?), see Pag., 1862, 298.—Monost.

thompsonii Mueller, 1841, 147.—1841: Cyclocirra (? type).

thunninæ Par. & Per., 1889, 742, t. h. Thynnus thunnina; Genova.—1889: Octocotyle. 1890: Octobothrium. 1896: Hexacotyle.

thynni Delaroche, 1811a, 271, t. h. Scomber thynnus; Maroque.—1811: Polyst. [1815: Hexost., type.] 1828: Hexacotyla (type). 1840: Hexacotyle (type). [1850: Plagiopeltis duplicata, type]. 1890: Exacotyle. 1891: Plagiopeltis.

thynni Tasch., 1879, 612 (Monost. bipartitum, renamed), t. h. Thynnus vulgaris.—1879: Didymozoon, type. [1902: Didymocystis reniformis, type].

thynni Par. & Per., 1891, 19, [lapsus for thunninæ?].—1891: Octocotyle.

tincæ Modeer, 1790, 127, t. h. Cyprinus tinca.—1790: Fasc. 1809: Dist. [1809: D. globiporum]. [1850: D. perlatum.]

tobiani Krœyer, 1846–53a, 592, t. h. Ammodytes tobianus.—1846–53: Dist.

todari delle Chiaje, 1841, 139.—1841: Dist.

todari delle Chiaje, see Par., 1894, 168, in Ommastrephes todarus; Naples.—Monost.

tornatum Rud., 1819a, 684, t. h. Coryphæna equiselis, C. hippuris.—1819: Dist. 1845: D. (Apoblema). 1889: Apoblema. 1899: Hemiurus. 1901: Lecithocladium.

torosum Setti, 1897, 4, t. h. Squalus sp.; Massaua.—1897: Otiotrema (type). 1903: Dist.

torpedinis Chatin, 1874a, 11, t. h. Torpedo marmorata; Mediterranean.—1874: Amphibdella (type). 1890: Tetraonchus.

torulosum Rud., 1814a, 104, t. h. Silurus glanis; Greifswald.—1814: Dist.

torva Mueller, 1774, 62, in aquis.—1774: Fasc. 1776: Planaria.

totari E. Bl., 1847a, 309, for todari (Dist.).

totari E. Bl., 1847a, 309, for todari (Monost.).

trachea Montagu, 1811, 194, t. h. poultry, Gallus gallus.—1811: Fasc. 1819: Dist. [Syngamus trachealis, a nematode].

tracheicola Braun, 1901, 943, t. h. Anas fusca; Vienna, Austria.—1901: Orchipedum (type).

trachini Par. & Perugia, 1889, 744, t. h. Trachinus radiatus; Genova.—1889: Microcotyle.

trachuri Ben. & Hesse, 1863, 1864, 118, t. h. Caranx trachurus.—1863: Gastrocotyle (type).

trachuri Par. & Perugia, 1890, 11, t. h. Caranx trachurus; Genoa.—1890: Pseudaxine (type).

translucida Staff., 1902, 413, t. h. Bufo lentiginosus, Rana virescens; America.—1902: Gorgodera. 1905: Gorgoderina.

transversalis Rud., 1802, 69, t. h. Cobitis fossilis; Berlin, Germany.—1802: Fasc. 1809: Dist. 1901: Allocreadium.

trapezium Leidy, 1891a, 414, t. h. Pandion carolinensis.—1890: Dist.

tremellaris Mueller, 1774, 72, in mare Balthico, Hafniam alluente.—1774: Fasc. 1776: Planaria.

tremoctopodis Kœlliker, 1849e, 67.—1849: Hectocotylus. [1849: ♂ of Tremoctopus.]

triangulare Johnston, 1904, 108, t. h. Dacelo gigas.—1904: Hemist.

triangulare Dies., 1850a, 351, t. h. Merops apiaster.—1850: Dist. 1899: Megacetes (type). 1901: Plagiorchis. 1900: Eumegacetes (type).

triangulare Dies. of Looss, see emendatus Braun.—1899: Megacetes (type). [1900: Eumegacetes, type].

triangulare Johnston, 1904, 108, t. h. Dacelo gigas.—1904: Hemist.

triangularis Goto, 1894a, 200, t. h. Acanthias schlegelii; Misaki, Japan.—1894: Axine.

tricaudata Schrank, 1803, 86.—1803: Cerc.

tricolor Stiles & Hass., 1894, 729, t. h. Lepus sylvaticus, L. americanus; Maryland.—1894: Dist.

trifolium Braun, 1901, 947, t. h. Ardea coicoi; Brazil.—1901: Dist.

triganocephalum Kampmann, 1894b, 454, misprint for trigonocephalum (Dist.).

trigla Ben. & Hesse, 1863; 1864, 92, t. h. Trigla.—1863: Udonella.

triglæ Ben. & Hesse, 1863, 117; 1864, 117, t. h. Trigla hirundo.—1863: Axine.

triglæ Ben., 1870, 30, t. h. Trigla hirundo; Belgium.—1870: Gasterost.

triglæ Rud., 1819a, 122, t. h. Trigla cuculus; C. E. V.—1819: Dist.

triglæ gurnardi Rathke, 1799, 68, t. h. Trigla gurnadus.—1799: Dist. [D. soleæforme.]

triglæ pini Dies., 1855, 64, t. h. Trigla pini.—1855: Dist. [1858: D. homoeostomum.]

trigonocephala Rud., 1802b, 87, F. melis Schrank, renamed, t. h. Schweinigel.—1802: Fasc. 1809: Dist. (Echinost.). [1828: type of festucaire.] 1860: Echinost.

trigonocephalum Rud., 1809a, 336, t. h. Testudo mydas; Europe.—1809: Monost. (Monost.) 1901: Pleurogonimus.

trigonocephalum Rud. of Looss, 1899b, 666, renamed obliquus 1901.—1899: Pronocephalus (type, see obliquus).

trigonocerca Dies., 1858d, 259, C. limacis Moul., t. h. Limax cinereus. L. (Arion) rufus; Geneva.—1858: Cerc. (Acanthocephala).

trigonostoma Wagener, 1857, 90, t. h. Cyprinus rutilus.—1857: Dactylogyrus.

triloba Fil., 1857c, 3, t. h. Planorbis carinatus, Lymnæus stagnalis; Turin.—1857: Cerc. 1858: C. (Acanthocephala).

trilobum Rud., 1819a, 104, t. h. Pelecanus carbo; Mus. Vien.—1819: Dist. 1850: Hemist.

tringæ Brand., 1892, 507, t. h. Tringa variabilis; Sinai.—1892: Monost. [1902: Cyclocœlum.] 1902: Hæmatotrephus.

tringæ helveticæ Rud., 1819a, 120, t. h. Tringa helvetica; C. E. V.—1819: Dist. [1850: D. cinctum.]

tripes Bosc, 1802a, v. 3, 227, see also tripos (Cerc.).

tripos Mueller, 1776, 206, in aqua marina.—1776: Cerc. 1827: Ceratium.

tripunctata Erc., 1881e, 23, t. h. Planorbis corneus; Italy.—1881: Cerc.

tripus Gmelin, 1790a, 3892, for tripos (Cerc.).

triserialis Dies., 1839a, 234, t. h. Anas anser dom. et ferus, etc.; Europe.—1839: Notocotylus (type). 1840: Nocotylus. 1850: Notocotyle (type). 1860: Monost.

troncatum Perroncito, 1882, 248, for truncatum (Dist). [Ercolani.]

truitta Bosc, 1802a, 274, for truttæ (Fasc.).

truncata Mueller, 1806, 35, t. h. Perca lucioperca.—1806: Fasc. 1814: Dist.

truncata Dies., 1850a, 422, Octostoma scombri renamed, t. h. Scomber scombrus; Rhedoni.—1850: Octocotyle. 1858: Octoplectanum. 1879: Octobothrium.

truncata Goto, 1894a, 191, t. h. Pristipoma japonicum; Japan.—1894: Microcotyle.

truncata Bosc, 1802a, 262.—1802: Planaria.

truncata Leidy, 1851b, in 224–227, free form; Newark, Del.—1857: Planaria.

truncatum Rud., 1819a, 91, t. h. Phoca vitulina; Europe, Berlin, Vratislaviæ.—1819: Amphist. 1886: Dist. 1896: Opisthorchis. 1899: Metorchis.

truncatum F. S. Leuck., 1842, 34, t. h. Sorex fodiens.—1842: Dist.

truncatum Erc., 1859a, 382, t. h. Canis familiaris; Italy.—1859: Dist. [D. truncatum (Rud.).]

trunkatum Schneidemuehl, 1896, 303, for truncatum (Amphist.).

truttæ Moul. of Dies., 1858, 356.—1858: Dist.

truttæ Frœlich, 1789, 126, t. h. Salmo trutta; Europe.—1789: Fasc. [1809: Dist. laureatum.]

truttæ (*intestinalis*) Rœderer, 1762, 537, t. h. forelle.—1762: Fasc. [1810: Ligula nodosa.] [1809: ?Echinorhynchus fusiformis.] [1905: Echinorhynchus.]

tuba Linst., 1878, 228, t. h. Squalius leuciscus.—1878: Dactylogyrus.

tuba Braun (1805), 49.—1805: Hirudo. [1809: Amphist. subclavatum.]

tubarium Rud., 1819a, 111, t. h. Sciæna umbra; Spezia.—1819: Dist.

tuberculata Fil., 1857c, 8, t. h. Paludina impura.—1857: Cerc. 1858: C. (Gymnocephala).

tuberculatum Cobbold, 1875n, 819, t. h. ox; India.—1875: Amphist.

tubiporum Dies., 1836a, 14, t. h. Trigla hirundo.—1835: Trist. 1840: Capsala. [1850: Trochopus longipes, type.] 1864: Trochopus (type).

tubiporum Braun, 1900, 388, t. h. Vespertilio sp.—1900: Dist.

tubulatum Rud., 1819a, 675, t. h. Muræna sp.; Brazil.—1819: Dist.

tumbesiana Wacke, 1903, 1.—1903: Temnocephala.

tumidulum Rud., 1819a, 95, t. h. Syngnathus hippocampus; Vienna.—1819: Dist. 1901: Allocreadium.

turbo Mueller, 1786, 123, in aqua rivulari cum Lemna rarior.—1786: Cerc. [1827: Urocentrum, type.]

turdi Rud., 1819a, 120, t. h. Turdus saxatilis; C. E. V.—1819: Dist. [1850: D. mesostomum; D. nephrocephalum.]

turgidum Brand., 1888, 247, t. h. Rana esculenta.—1888: Dist. 1899: Brandesia (type).

tursionis Marchi, 1872, 304, t. h. Delphinus tursio, int.—1872: Dist. 1896: D. (Dicrocœlium). [D. (Dicrocœlium) longissimum Poir.]

tynni Crety, 1892c, 399, for thynni (Exacotyle).

typica Dies., 1858c, 366, t. h. see p. 369; Europe.—1858: Tetracotyle (type).

[*typus*, reptile, Bucephalus.]

umblæ Fabricius, 1780a, 329, t. h. Salmo umbla; Greenland.—1780: Fasc. 1803: Dist. [1809: D. seriale.]

umbonatum Odhn., 1902, 21, t. h. Krokodil; Nile.—1902: Echinost.

umbrinæ Stoss., 1885, 159, t. h. Umbrina cirrhosa; Triest.—1885: Dist. 1905: Allocreadium. 1886: D. (Brachylaimus).

unciforme Rud., 1819a, 674, t. h. Oriolus cristatus; Brazil.—1819: Amphist. 1850: Holost.

uncinata Dies., 1850a, 412, lapsus for uncinulata.—1850: Fasc. [1850: Polyst. integerrimum.]

uncinatum Macé (1880).—1880: Polyst.

uncinatum Zed., 1803a, 221, t. h. Fulica chloropus.—1803: Dist. 1809: D. (Echinost.). 1860: Echinost. [1892: E. cinctum.]

uncinatum Mont., 1889, 117, t. h. ?Pleuronectes; Coll. Leuck.—1889: Trist.

uncinatus Wagener, 1857, pl. 13, fig. 2, t. h. Perca fluviatilis.—1857: Dactylogyrus.

uncinulata Braun, 1790, 58, t. h. Rana esculenta; Germany.—1790: Planaria. 1790: Fasc. [1800: Polyst. ranæ, type.] [1850: Polyst. integerrimum.]

uncinulatum Macé in Braun, 1890a, 418, for uncinatum (Polyst.).

undulatus Looss, 1899, 594, t. h. Thalassochelys corticata; Abukir.—1899: Cymatocarpus (type).

unguicolatus Mont., 1888, 90, for unguiculatus Tetraonchus (Dactylogyrus).

unguiculatum Rud., 1819a, 91, t. h. Triton palustris; Berlin, Germany.—1819: Amphist. 1836: Diplodiscus.

unguiculatus Wagener, 1857, 61.—1857: Dactylogyrus. 1858: Tetraonchus.

unicum Mol., 1859, 835, t. h. Centrolophus pompilius; Padua.—1859: Dist. 1886: D. (Podocotyle).

unicum Odhn., 1902, 66, t. h. Serranus sp.; Sinai, Red Sea.—1902: Phyllodist.

unicum Looss, 1896b, 44, renamed reniferum; t. h. Trionyx nilotica; Egypt.—1896: Dist. 1899: Astia (type).

unionicola Graff, 1904, 457, t. h. Muscheln.—1904: Planaria.

upupæ Schrank, 1790, 123, t. h. Upupa epops, rectum.—1790: Fasc. [1809: Dist. involutum.]

urcatum Luche, 1900, 489, misprint for furcatum (Dist.).

urna Looss, 1907, 485, t. h. Vesperugo kuhli; Cairo, Egypt.—1907: Lecithodendrium.

urniceps Schlotthauber, 1860, 129, t. h. Falco pygargus.—1860: Holost.

urnigerum Rud., 1819a, 89, t. h. Rana esculenta; Mus. Vien.—1819: Amphist. 1845: Holost. [1850: Codonocephalus mutabilis, type.]

urocotyle Par., 1899, 6, t. h. Scorpæna scrofa; Portoferrajo.—1899: Pleorchis. 1905: Derogenes.

vagans Leidy, 1850, 304, t. h. Helix alternata, H. albolabris; D. helicis renamed.—1850: Dist. 1855: Cercariæum.

vaginatum Brand., 1888a, 64, t. h. Cathartes sp.; Brazil.—1888: Holost.

valdeinflatum Stoss., 1883, 114, t. h. Gobius jozo; Triest.—1883: Dist. 1886: D. (Echinost.) 1898: Agamodist. [1899: Stephanost. cesticillus.]

valdemflatum Nicoll, 1907, 69, for valdeinflatum (Dist.).

validum Linst., 1886, 124, t. h. Delphinus sp.; South Atlantic.—1886: Dist. 1892: D. (Brachylaimus).

vallei Stoss., 1896, 129, t. h. Falco subbuteo.—1896: Dist.

vallei Stoss., 1899, 3, t. h. Thalassochelys caretta; Corfu.—1899: Aspidogaster. [1901: Lophotaspis adhærens.] 1902: Lophotaspis, type. 1902: Amphist., probably lapsus.

vallei Par. & Per., 1895, 3, t. h. Naucrates ductor; Genova.—1895: Placunella. 1903: Ancyrocotyle (type).

van benedeni St. Remy, 1898, 567, for van benedenii (Dactylogyrus).

van benedenii Par. & Per., 1890, 96–97, t. h. Mugil auratus.—1890: Tetraonchus.

van benedenii Par. & Per., 1895, 2, t. h. Mugil auratus; Triest.—1895: Dactylogyrus. See also benedenii.

vanelli Rud., 1819a, 87, t. h. Tringa vanellus; Mus. Vien.—1819: Monost. [1850: M. mutabile.]

variabile Leidy, 1856, 44, t. h. Tropidonotus sipedon.—1856: Dist. 1903: Renifer.

variabile Nitzsch, 1819, 400, includes macrocephalum Rud., t. h. owls; Germany.—1819: Holost. (type). 1860: Monost.

varica Mueller, 1784, 93, t. h. Salmo salar, stomach.—1784: Fasc. 1803: Dist. 1886: D. (Brachylaimus). 1899: Hemiurus. 1901: Derogenes.

varicans Abildg., 1794, 89, in aqua rivulari.—1794: Cerc. 1850: Cheilost. (type).

variegatum Crep., 1825a, 38, t. h. Larus marinus; Greifswald.—1825: Amphist. 1845: Holost.

variegatum Rud., 1819a, 99, t. h. Rana esculenta; Berlin.—1819: Dist. 1845: D. (Brachylaimus). 1847: Brachylæmus. 1850: Brachylemus. 1899: Hæmatolœchus (type). 1902: Pneumonœces (type).

variegatum Looss, 1892, 93, misprint for variegatum (Dist.).

variolaris Fuhrmann, 1904, 59, t. h. Rostrhamus sociabilis; South America.—1904: Bothriogaster (type).

[*variolosus* Gærtner (Dist.), a tunicate.]

varioplerus Staff., 1902, 901, t. h. Rana catesbiana; Canada.—1902: Hæmatolœchus. 1905: Pneumonœces.

varium Eysenhardt, 1829, 148, t. h. Gadus merluccius.—1829: Dist.

varsoviensis Ssinitzin, 1905, 36, t. h. frogs; Warschau.—1905: Gorgodera. 1906: Cerc.

velellæ Fil., 1843, 66, see Dies., 1850a, 379, t. h. Velella spirans; Naples.—1843: Dist. [1850: D. megacotyle.]

velellæ Graff, 1904, 456.—1904: Plan.

veliporium Johnston, 1902, 329, misprint for veliporum (Dist.).

veliporum Crep., 1837a, 310, t. h. Squalus griseus.—1837: Dist. 1886: D. (Cladocœlium). 1904: Otodist. (type).

venarum Treutler, 1793, iv, 23, t. h. Homo.—1793: Hexathyridium. 1803: Fasc. 1803: Polyst. 1828: Hexathiridium. 1836: Polyst. (Hexast.). 1850: Hexacotyle. [Hexast.] [1840: Linguatula.]

ventricolum Rud., 1809a, 334, misprint for ventricosum (Monost.).

ventricosa Rud., 1802, 20, t. h. Nachtigall; Greifswald.—1802: Festucaria. 1809: Monost. (Monost.).

ventricosa Bosc., 1802a, 257.—1802: Planaria.

ventricosa Pallas, 1774, 17, host not given; Amboyna.—1774: Fasc. 1853: Hirudinella. 1893: Dist.

ventricosum Rud., 1819a, 108, t. h. Clupea alosa; Arimini.—1819: Dist. 1886: D. (Apoblema). 1893: Apoblema.

ventricosum Stoss., 1898, 29, t. h. Alausa finta; Triest.—1898: Dist. [1898: Apoblema ocreatum Rud.]

ventricosum var. *minor* Shipley, 1900, 540, t. h. Pimelepterus sp.; New Britain.—1900: Dist.

vereticolle lucii Rud., 1809a, 400, lapsus for tereticolle lucii (Dist.).

vermicularis Mueller, 1786, 133, in aqua ubi Lemna vegetat.—1786: Cerc. 1827: Dicranophorus.

verrilli Goto, 1899a, 283, t. h. a skate (Raja); Cape Cod.—1899: Acanthocotyle.

verrocosum Mont., 1892, 40, for verrucosum (Notocotyle).

verrucosa Frœlich, 1789, 112, t. h. domesticated geese.—1789: **Fasc.** 1800: **Monost.** 1809: Monost. (Monost.). [1839: Notocotylus triserialis.] 1892: **Notocotyle.** 1905: Catatropis (type).

verrucosum Busch, 1851, 100, t. h. Ophidium barbatum.—1851: **Dist.** 1886: D. (Crossodera).

verrucosum Mol., 1859, 842, t. h. Labrax lupus; Rennes, Padua.—1859: **Dist.** 1886: D. (Dicrocœlium).

verrucosum Poir., 1885, 10, t. h. Thynnus.—1885: Dist.

verrucosum Lint., 1892, 96, t. h. Larus californicus.—1892: Dist.

verucosa Odhn. LV, 1902, 63, for verrucosum (Notocotyle).

vesicata Uličný, 1878, 211, t. h. Cyclas rivicola; Mähren.—1878: Cerc. [1894: C. macrocerca.]

vesiculifera Dies., 1855a, 389, C. vesiculosa Fil., renamed.—1855: Cerc. 1855: C. (Xiphidiocerc.). 1858: C. (Acanthocephala).

vesiculosa Dies., 1850a, 295, Cerc. I Baer. renamed; t. h. Paludina vivipara; Regiomontii.—1850: Cerc. 1855: C. (Eucerc.). 1858: C. (Acanthocephala).

vesiculosa of Fil., 1854a, 12, t. h. Paludina vivipara.—1854: Cerc. [1855: C. (Xiphidiocerc.) vesiculifera.]

vespertilionis Mueller, 1784, 95, t. h. Vespertilio auritus.—1784: **Fasc.** 1803: **Dist.** [----: Plan.] [1850: D. lima.] 1900: Plagiorchis.

vespertilionis Rud., 1819a, 87, t. h. Vespertilio noctula; Cat. Ent. Vienn.—1819: Monost.

vetustum Staff., 1904, 487, t. h. Limanda ferruginea; Woods Hole.—1904: **Stenakron** (type).

vexans Braun, 1901, 947, t. h. Turdus merula.—1901: Dist.

vibex Lint., 1900, 269, t. h. Spheroides maculatus.—1900: Dist.

vicarium Braun, 1901g, 896, t. h. Ibis cœrulescens; Brazil.—1901: **Stomylotrema.**

vicinus Odhn., 1902, 24, t. h. Nilkrokodil; Sudan.—1902: **Acanthochasmus.**

villoti Mont., 1888, 194, C. setifera Mueller, of Villot, 1879, renamed, in Scrobicularia tenuis. -1888: Cerc.

vinal-edwardsii Lint., 1901, 416, t. h. Opsanus tau. Orthopristis chrysopterus; Beaufort, N. C.—1901: Monost.

viperæ Linst., 1877, 186, t. h. Pelias berus.—1877: Dist. 1895: Agamodist.

viperæ Ben., 1870, 26, t. h. Trachinus vipera; Belgium.- 1870: Gasterost.

virgula Fil., 1837, 338, t. h. Paludina impura, Valvata piscinalis; Ticini, Italy.—1837: Dist. 1850: Cerc. 1855: C. (Eucerc.). 1858: C. (Acanthocephala). [1858: D. maculosum.]

viridata Bosc., 1802a, 258.—1802: Plan.

viridis Mueller, 1786, 126, in aquis fossarum stagnantibus primo vere.—1786: Cerc. 1815: Furcocerca. 1827: Enchelys.

viridis Bosc., 1802a, 256.- 1802: Plan.

viridis Mueller, 1774, 59, in radicibus fucorum; Greenland.—1774: Fasc.

vitellatum Linst., 1875, 189, t. h. Totanus hypoleucus.—1875: Dist. 1901: **Plagiorchis.** 1892: D. (Brachylaimus).

vitellilobum Olss., 1876, 14, t. h. Rana temporaria.- 1876: Dist. 1889: D. (Dicrocœlium). 1902: Gorgoderina. 1906: Gorgodera. 1906: Cerc.

vitellosum Lint., 1900, 269, t. h. Merluccius bilinearis; Woods Holl.—1900: Dist.

[*vitreum* Sars (Dist.), a tunicate.]

vitrina Linst., 1887, 105, t. h. Zebrina detrita: Frauenberg b. Sondershausen.—1887: Cerc.

vitrinæ Targioni Tozzetti, 1873, 335, in vitrine.- 1873: Dist.

vitta Duj., 1845a, 418, t. h. Mus musculus; Rennes.—1845: Dist. (**Brachylaimus**).

vivæ Ben., 1870, 25, t. h. Trachinus draco; Belgium. 1870: Gasterost.

vivax Sons., 1892, Oct. 7, 137, t. h. Cleopatra bulimoides; Cairo, Egypt.- 1892: Cerc.

viverrini Poir., 1886, 27, t. h. Felis viverrinus.—1886: Dist. 1892: D. (**Dicrocœlium**). 1896: Opisthorchis.

viripara Ben., 1870, 28, t. h. Mugil chelo; Belgium.—1870: Dist.

viviparæ Linst., 1877, 185, t. h. Paludina vivipara.—1877: Monost. 1892: Monostomulum.

viviparæ fasciatæ Linst., 1877b, 186, t. h. Vivipara fasciata.—1877: Dist.

viviparum Olss., 1868, 28, t. h. Pleuronectes microcephalus.—1868: Dist. 1886: D. (Echinost.). 1901: Zoogonus. 1902: Zoogonoides (type).

vogtianum Baudon, 1881, 145, t. h. Succinea baudoni.—1881: Leucochloridium.

voluptarium Braun, 1901, 945, t. h. Falco sp.—1901: Dicrocœlium.

volvens Nord., 1832, 28, t. h. Gadus lota, Perca cernua, P. fluviatilis, P. lucioperca.—1832: Diplost. (type). 1833: Dist. [1898: Hemist. spathaceum.]

vulgaris Cerf., 1899a, 375, t. h. Mustela vulgaris.—1899: Squalonchocotyle.

vulpina Abildg., 1790, 63.—1790: Dist. [Hemist. alatum.]

vulpis Gmelin, 1790a, 3053, t. h. Canis vulpes; Europe.—1790: Fasc. [1809: D. alatum.] [1850: Hemist. alatum.]

vulpis Schrank, 1788, 52, t. h. Canis vulpes; Germany; Planaria alata vel dubia Gœze, 1782a, 176, pl. 14, figs. 11-13, renamed.—1788: Alaria (type).

wachniæ Rud., 1819a, 122, 427, t. h. Gadus wachnia.—1819: Dist. 1878: Trematodum.

watsoni Conyngham, 1904, Aug. 13, 464; Sept. 17, 663, t. h. Homo; in Zola (Nigeria), came from Adamawa, German West Africa.—1904: Amphist. 1905: Cladorchis.

wedli Ariola, 1902, 105, t. h. Thynnus vulgaris; Naples.—1902: Didymocystis.

wedlii Cobbold, 1860a, 18, t. h. Rana esculenta.—1860: Dist.

wedlii Cobbold, 1860a, 43, t. h. Rhombus lævis, M. rhombi lævis Wedl, renamed.—1860: Monost.

westermani Kerbert, 1881a, July, 529, for westermanii.—1881: Dist. 1891: Dist. 1899: Paragonimus (type). 1905: Paragonimus.

westermanii Kerbert, 1878a, 271, t. h. Kœnigstiger.—1878: Dist. 1890: Mesogonimus. [1899: Paragonimus (type.)] [1899: Polysarcus, type.] 1900: Paragonimus.

westermanni Leuck., 1889, 404, for westermanii Kerbert, 1878.—1889: Dist. 1890: Mesogonimus. 1891: Dist. 1898: Dist. (Mesogonimus). [1899: Paragonimus (type).] 1899: Polysarcus (type).

westrumbii Cobbold, 1860a, 45, Amphist. sphærocephalum Westrumb, renamed; t. h. Coracina scutata; Brazil.—1860: Holost.

winogradoffi Jaksch, 1897a, 219 for sibiricum, t. h. Homo.—1889: Dist.

xanthostoma var. *compascua* Kowal., 1898, 71, t. h. Anas querquedula.—1898: Opisthorchis.

xanthosomum Crep., 1846a, 138, t. h. Colymbus septentrionalis; Germany.—1846: Dist. 1898: Opisthorchis. 1902: Metorchis.

zschokkei Volz, 1899, 231, t. h. Heterodon platyrhinus.—1899: Dist. 1903: Renifer.

[For addenda, see p. 385.]

BIBLIOGRAPHY OF SUPERGENERIC, GENERIC, AND SPECIFIC NAMES USED IN TREMATODA AND OF DISEASES CAUSED BY TREMATODA.

The main portion of this index is made up of an alphabetical list of superspecific names used in connection with *Trematoda*. Under each generic or subgeneric name will be found a list of the species and subspecies which have been placed in the groups in question. The references following the technical names represent the places in literature which bear upon the technical names in question. Names of diseases caused by *Trematoda* are also inserted in this list.

In all cases possible, the type species [a] is mentioned for genera. In connection with the species, the hosts and locality, at least the type locality, are usually given.

(ACANTHOCEPHALA) Dies., 1858d, 253–255 (subg. of Cerc.) [not Acanthocephala Rud., 1808, worms, order; Acanthocephali Burm., 1837, worms, order; Acanthocephalus Kœlreuter, 1771, worms, genus; Acanthocephalos Gœze, 1782, for Acanthocephalus, 1771; Acanthocephala Laporte, 1832, hemipteron, genus; Acanthocephalus for Acanthocephala 1832]. C. (Xiphidiocerc.), 1855, renamed, hence same type.[a]

armata (Sieb., 1837) Dies., 1858d, 251–252 (larva of Dist. endolobum Duj. [Opisthioglyphe 1899, type]) (in Planorbis corneus, Paludina impura, Lymnæus stagnalis).

brachyura (Dies., 1850) Dies., 1858d, 257 (in Planorbis submarginatus; Ticini; P. nitidus, P. vortex).

buccini mutabilis (Fil., 1855) Dies., 1858d, 266 (in Buccinum (Nassa) mutabile; Genoa).

chlorotica (Dies., 1850) Dies., 1858d, 252–253 (syn. Cerc. (Eucerc.) chlorotica Dies.) (in Paludina vivipara).

gibba (Fil., 1854) Dies., 1858d, 257 (in Lymnæus pereger; Turin).

linearis (Lespés, 1857) Dies., 1858d, 258 (in Litorina litorea).

macrocerca (Fil., 1854) Dies., 1858d, 255 (larva of Dist. cygnoides Zed.) (in Cyclas cornea; Turin); 1858c, 334 (syn. of Dist. cygnoides; [type of Gorgodera, 1899]).

micracantha Dies., 1858d, 259–260 (syn. Cerc. armata Fil., 1855b) (in Lymnæus palustris, Triton punctatus).

microcotyla (Fil., 1854) Dies., 1858d, 253 (syn. C. pugnax La Valette) (in Paludina achatina, Lombardia; P. vivipara) (larva of Dist. tetracystis [type of Cystagora 1905]); 1858c, 348 (syn. of Dist. tetracystis).

micrura (Fil., 1857) Dies., 1858d, 258 (in Paludina vivipara; Turin). See globiporum type of Sphærost.

ornata (La Valette, 1855) Dies., 1858d, 244, 255–256 (larva of Dist. clavigerum Rud. [type of Pleurogenes, 1899]) (in Planorbis corneus, Berlin; Hydrachna concharum, Heidelberg); 1858c, 338 (syn. of Dist. clavigerum).

pachycerca Dies., 1858d, 257–258 (syn. Cerc. brachyura Lespés) (in Trochus cinereus; Francogalliæ).

[a] See p. 385, Addenda.

(ACANTHOCEPHALA)—Continued.

planorbis carinati (Fil., 1857) Dies., 1858d, 266 (in Planorbis carinatus; Turin).

subulo (Pag., 1857) Dies., 1858d, 256–257 (in Paludina vivipara; Heidelberg).

trigonocerca Dies., 1858d, 259 (syn. Cerc. limacis Moul.) (in Limax cinereus, L. (Arion) rufus; Geneva).

triloba (Fil., 1857) Dies., 1858d, 252 (in Lymnæus stagnalis, Planorbis carinatus).

vesiculifera (Dies., 1855) Dies., 1858d, 254–255 (syns. Cerc. vesiculosa Fil., C. (Xiphidiocerc.) vesiculifera Dies., C. microcotyla Fil.) (in Paludina vivipara, P. achatinæ).

vesiculosa (Dies., 1850) Dies., 1858d, 254 (in Paludina vivipara; Regiomontii, Berlin, Heidelberg).

virgula (Fil., 1837) Dies., 1858d, 260 (larva of Dist. maculosum Rud.) (in Valvata piscinalis, Paludina impura).

ACANTHOCHASMUS Looss, 1900d, Dec. 3, 603, Acanthostomum Looss, 1899 [not Acanthostoma Kriechbaumer, 1895, insect] renamed, hence type spiniceps; *χασμάομαι*, den Rachen offen haben; 1901e, 595, 629, 634, 659; 1901f; 1902g; 1902m, 441, 780, 808, 838.—Braun, 1901b, 34, 35, 36; 1902b, 30.—Odhn., 1902, 23, 25, 37; 1902, 159.—Pratt, 1902a, 888, 894 (key).

absconditus Looss, 1901e, 631–632, fig. 8 (intest. of Bagrus bayad, B. docmac).

coronarius (Cobbold, 1861) Braun, 1901b, 35, 36.—Odhn., 1902, 25 (in alligator).

imbutiformis (Mol., 1859, partim) Looss, 1901e, 632–633, 634, fig. 9 (intest. of Labrax lupus, Dentex vulgaris; Egyptian coast and Triest).—Odhn., 1902, 25.

præteritus Looss, 1901e, 633–634, fig. 10 (first half of intest. of Labrax lupus, Chrysophrys aurata, Corvina nigra; Triest and Egyptian coast).

productus Odhn., 1902, 24, 25 (in Nilkrokodil; Sudan).

scyphocephalus (Braun, 1899) Braun, 1901b, 35, fig. 14.—Odhn., 1902, 25.

spiniceps (Looss, 1896) Looss, 1901e, May 4, 629–631, fig. 7 (intest. of Bagrus bayad, B. docmac).—Braun, 1901a, 35, 36.—Odhn., 1902, 25.

ricinus Odhn., 1902, 24–25 (in Nilkrokodil; Sudan).

ACANTHOCOTILE Par. & Perugia, 1890, 11, 13, for Acanthocotyle.

ACANTHOCOTYLE Mont., 1888a, 7, 10, 11, 13, 16, 20, 30, 34, 35, 36, 37, 42, 43, 52, 55, 56, 57, 58, 59, 60, 66, 67 (Achantocotyle), 87 (m. lobianchi), 97 (in "subf." Tristomidæ, key); 1890, 189, 190, 208, figs. 1–5, pl. 8; 1891, 104, 106, 107, 111, 116; 1892, Oct. 7, 180, 213 (g. of Tristominæ); 1899a, 75–120, pls. 1–3; 1905, 71, 72, 73, 74, 75.—Braun, 1890a, 411, 412, 488, 523, 526, 529 (diagnosis); 1891d, 422; 1893a, 889.—Gamb., 1896a, 73.—Goto, 1899a, 283.—Massa, 1906, 45, 48.—Pratt, 1900a, 646, 649 (key), 655, fig. 10, 659.—Scott, 1902, 300, 301.

1888: Achantocotyle Mont., 1888, 67, misprint.

1900: Acanthocotile Par. & Perugia, 1890, 11, 13.

1902: Acanthtcotyle Scott, 1902, 301, for Acanthocotyle.

concinna Scott, 1902, 301, no host given.

elegans Mont., 1890, 191, fig. 3 (on Raja clavata; Naples); 1899, 76, 77, 78, 79, 80, 81, 82, 85, 87, 88, 91, 93, 97, 99, 100, 101, 106, 107, 108, 110, 113–115, pl. 1, figs. 7, 8, pl. 2, figs. 13, 17, 19, 23, 25b, 28, 29, 32, pl. 3, figs. 44, 45; 1891, 107; 1899, 108; 1905, 73, 74, 75.—Braun, 1890a, 529, 547, 551.—Scott, 1902, 301.

lobianchi Mont., 1888a, 7, 13, 15, 16, 19, 22, 23, 26, 29, 31, 34, 56, 87 (on Raia clavata); 1890, 190; 1891, 102, 104 (lobianchii), 107, 116, 120, 130, pl. 5, figs. 9–10, pl. 6, figs. 36–39; 1893, 20; 1899, 108.—Braun, 1890a, 529, 547 (Naples), 551.

lobianchii Mont., 1891, 104, for lobianchi.

lobianchoi Goto, 1899a, 285, for lobianchi.

lobiancoi Mont., 1899, 75 (for lobianchi), 76, 77, 78, 80, 81, 83, 84, 85, 87, 89, 91, 94, 97, 100, 101, 106, 107, 108, 111–113, 116, 117, pl. 1, figs. 1, 3, 4, 5, 6, 10, pl. 2, figs. 11, 15, 16, 18, 21, 22, 25, 26, 31, 33, pl. 3, figs. 34–43, 46, 47, 49–58; 1905, 72, 73, 74.—Scott, 1902, 300.

monticelli Mont., 1905, 74, for monticellii.

monticellii Scott, 1902, 300–302, pl. 13, figs. 31–33 (in Raia clavata; Aberdeen, Scotland); 1905, 117.—Mont., 1905, 74, 75 (monticelli), figs. 4–5.

ACANTHOCOTYLE—Continued.

oligoterus Mont., 1899, 76, 77, 78, 80, 81, 84, 85, 87, 91, 100, 101, 105, 106, 107, 108, 111, 115–117, pl. 1, figs. 2, 9, pl. 2, figs. 12, 14, 20, 24, 25c, 27, 29, pl. 3, figs. 48 (on Raja clavata; Naples); 1905, 73, 74, 75 (in R. punctata).—Goto, 1899a, 283.—Scott, 1902, 301.

verrilli Goto, 1899a, 283–286, pl. 21, figs. 25–26 (on a skate, Raja; Cape Cod).—Mont., 1905, 71–75.—Pratt, 1900a, 655, fig. 10, 657, 659 (key).—Scott, 1902, 302.—Staff., 1904, May 3, 482 (on Raja radiata Donovan; Canada).

ACANTHOCOTYLEA Dies., 1850a, 649, subtribe of Monocotylea.

ACANTHOCOTYLINÆ Mont., 1903, 335 (subf. of Tristomidæ).

ACANTHONCHOCOTYLE Cerf., 1899a, 347, 373, 402, 420, 436, 445, 446, 451, 455 [type by inclusion appendiculata].—Mont., 1903, 336 (syn. of Onchocotyle).

appendiculata (Kuhn, 1829) Cerf., 1899a, 374, 379, 382, 461–462, pl. 19, figs. 6, 14a (in Scyllium catulus Cuv.; Roscoff).—Type of Onchocotyle 1850.

canicula Cerf., 1899a, 374, 379, 382, 402, 462, pl. 19, figs. 5, 13, 14b.c. (syn. Onchocotyle appendiculata Kuhn of Stoss., 1887) (in Scyllium canicula).

ACANTHOPSOLUS Odhn., 1905, 328–331 (m. oculatus).

oculatus (Levin., 1881) Odhn., 1905, 328–331, pl. 2, fig. 11 (in Lycodes pallidus in East Greenland; Cottus scorpius, west coast of Sweden).

ACANTHOSTOMUM Looss, 1899b, 575, 577–579 (tod. spiniceps), 578, [not Acanthostoma Kriechbaumer, 1895, insect], ἡ ἄκανθα, spine; 1900d, 603 (renamed Acanthochasmus); 1901e, 595.—Braun, 1901b, 34, 56; 1901i, 56.—Stiles, 1901, 189.

coronarium (Cobbold, 1861) Looss, 1899b, 578, 582.

spiniceps (Looss, 1896) Looss, 1899b, 578, 582.

ACANTHTCOTYLE Scott, 1902, 301, for Acanthocotyle.

ACCACŒLIUM Mont., 1893, 135 (contortum); subg. of Dist.—Raised to generic rank by Looss, 1899b, 631–632 (contortum as type); 1902, 839, 504.—Braun, 1901b, 27, 34, 37, 38.—Darr, 1902a, 698.—Luehe, 1900u, 487; 1901n, 481, 482–483, 485.—Odhn., 1905, 363.—Ofenheim, 1900, 183.—Pratt, 1902a, 889, 904 (key).

1893: Dist. (Accacœlium) Mont., 1893, 135, q. v.

1894: Accacœlum Zool. Record (1893) 1894, Vermes, 49.

calyptrocotyle (Mont., 1891) [Luehe, 1900u, 487].—To Orophocotyle in 1902.

contortum (Rud., 1819) Looss, 1899b, 632.—Darr, 1902a, 698.—Luehe, 1901n, 482, 483, 485.—Staff., 1904, 487 (Canada).

foliatum (Lint., 1898) Staff., 1904, 487 (Mola mola; Canada).

macrocotyle (Dies., 1858) Luehe, 1901n, 482.—Staff., 1904, 487 (Mola mola; Canada).

nigroflavum (Rud., 1819) Luehe, 1901n, 482, 483.—Looss, 1902, 639.—Staff., 1904, 487 (Mola mola; Canada).

[*pelagix* (Kœlliker, 1849), ———, 1900.]

raynerianum (Nardo, 1827) Luehe, 1901n, 482, 483, 485.—Par., 1902, 6 (in Luvarus imperialis).

ACCACŒLUM Zool. Rec. (1893), 1894, Vermes, 49 (for Accacœlium).

ACERCÆ Mont., 1888, 94 (group of Cerc. without tail).

ACHANTOCOTYLE Mont., 1888, 67 (for Acanthocotyle).

ACOTYLEA Dies., 1850a, 286, 293 (subtribe of Dicranocœla), 287, 304 (tribe of Trematoda).—Brand., 1888a, 12.—Burm., 1856a, 250.—Goldb., 1855, 15, 16.—Mol., 1861, 191.—Mont., 1888, 83, 84; 1891, 111.—Tasch., 1879, 233.

ACOTYLOCEPHALA Dies., 1858e, 314, 374 (f. of Trematoda plectanophora).—Ben. & Hesse, 1864a, 119 (syn. of Gyrodactylidés).—Mont., 1888, 84.

ACRODACTYLA Staff., 1904, May 3, 491 (m. petalosa) [not Acrodactyla Hal., ante 1846, hymenopteron], ἄκρος, end; δάκτυλος, finger.

petalosa (Lander, 1902) Staff., 1904, May 3, 491 (m. Acipenser rubicundus Le S.; Canada); includes Dist. auriculatum Wedl. of Lint.

ACTINODACTYLELLA Haswell, 1893f, Sept., 153–158, pl. 16, corrigendum (m. blanchardi), Actinodactylus Haswell, 1893 [not Duchassaing, 1890], renamed; 1894a, 256; (18—), 589–590.—Pratt, 1900a, 646, 648 (key).—St.-Remy, 1898, 522, 531.

1893: Actinodactylus Haswell, 1893d, 477 [not Duchassaing, 1890] [type blanchardi].

1899: Actinodactynella Mont., 1899, 81, type haswelli=blanchardi.

ACTINODACTYLELLA—Continued.

blanchardi Haswell, 1893f, 153–158, pl. 16, corrigendum (Engæus fossor; Gippsland, Victoria, Australia).—Pratt, 1900a, 655, fig. 1, 657.—St.-Remy, 1898, 531–532, fig. 2 (on Eng. fos.; Australia) (syn. Actinodactylus sp.; Haswell).

ACTINODACTYLIDÆ Haswell.—St.-Remy, 1898, 522.

ACTINODACTYLUS Haswell, 1893d, 477 [not Duchassaing, 1890]; 1893f, 153–158, corrigendum, pl. 16, renamed Actinodactylella Haswell.—Mont., 1899, 116.

ACTINODACTYNELLA Mont., 1899, 81, 86, 116, 117, 118, 119, 122 (type haswelli Mont., 1898=blanchardi Haswell, 1893, see Actinodactylella.)

blanchardi Haswell, 1893, teste Mont., 1899, 122.

haswelli Mont. (1898), 1899, 122 (in Engeus fossor; Australia, Gippsland, Victoria).

ACTINODACTYNELLINÆ Mont., 1899, 118, 121.—Pratt, 1900a, 646, 647 (key) (apparently for Actinodactylellinæ), subf. of Temnocephalidæ.

ADENOGASTER Looss, 1901l, Nov. 7, 620–621 (m. serialis); 1902m, 570, 583, 591, 601, 603, 609, 612, 615.—Pratt, 1902a, 890, 909 (key).

serialis Looss, 1901l, 620–621; 1902m, 545–548, pl. 26, figs. 71–74, 615, 875, pl. 26, figs. 71–74 (in Thalassochelys corticata; Alexandria, from Egyptian coast).

AGAMODISTOMA Rail., 1893a, 376 (for Agamodistomum, q. v.).

AGAMODISTOMUM Stoss., 1892, 4, 33–34 [collective group for immature forms, requires no type[a]]; 1895, 33; 1895, 228–229; 1898, 58.—Mont., 1893, 154.—Stiles, 1898a, 28; 1904, 8, 11, 12, 13.—Stiles & Hass., 1898a, 82, 96; 1899, 117; 1900a, 559; 1902f, 360.

1892: Distomulum Brand., 1892b, Oct. 7, 510.

1893: Agamodistoma Rail., 1893a, 376.

anguis (Linst., 1885) Stoss., 1895, 229 (in Anguis fragilis).

capsulare (Dies., 1858) Stoss., 1892, 176 (in Ardea cinerea, A. purpurea, Crex pratensis, Nycticorax griseus, Podiceps auratus, P. nigricollis).

chimæræ Ariola, 1899a, 8–10, pl. 5, fig. 7 (in Chimæra monstrosa; Genova, Italy); (1899) v. 10 (in 129–138); (———), 299.

celebs (Linst., 1875) Stoss., 1892, 176 (in Fringilla cœlebs; Ratzeburg).

gobii Stoss., 1898, 58–59 (encysted in Gobius jozo; Triest).

martiranoi Stiles, 1903aa, 15 (in Anopheles claviger), based on Martirano, 1901d, 849–852, figs. 1–4 [see also Mart., 1901b, 1089–1091, figs. 1–4; 1901c, 274; 1902a, 73; 1902b, 358].

ophthalmobium (Dies., 1850) Stoss., 1892, 33 (in Homo).—Stiles, 1902s, 24, 29–34; 1903u, 223 (ophthalmothium); 1905cc, 54.—Ward, 1903, 866.

ophthalmothium Luehe in Stiles, 1903u, 223, for ophthalmobium.

pusillum (Braun, 1790) Stoss., 1892, 33 (in Erinaceus europæus; Greifswald; Rennes).

putorii (Mol., 1858) Stoss., 1892, 34 (in Putorius communis; Padova, Ratzeburg).

suis Stiles, 1898a, 22, 28, 29, 143, fig. 1 (in Sus scrofa domestica; Germany); Dist. musculorum suis Duncker, 1896, 279, renamed.—Kastenbaum, 1899, (214), fig. 33, 4.—[See also Braun, 1893a, 870.—Duncker, 1881, 23–25; 1881, 141; 1881, 154; 1884, 39–42; 1896, 279–282.—Leuck., 1881, 46.—Moulé, 1885, 60–62.—Schndmhl., 1896, 302.—Stiles & Hass., 1900a, 559–560, fig. 23; 1902f, 360; 1904, 22.]

valdeinflatum (Stoss., 1883) Stoss., 1898, 59 (in Gobius jozo; Triest); "Rappresenta la larva dell' Echinostoma cesticillus Molin."—Barbagallo & Drago, 1903, 411 (in G. j.; Catania).

viperæ (Linst., 1877) Stoss., 1895, 228 (in Pelias berus).

"ALAIRE"[b] Blainv., 1824a, 518,[b] see "Alaria Blainv." of Dies., 1850a.—Leblond, 1837a, 518, 59, pl. 14, fig. 15 (teste Dies., 1850a, 374).

"ALARIA Blainv." of Dies., 1850a, 331 (for "alaire" [q. v.] Blainv., 1824a, 518, see Duj., 1845a, 437). See also Alaria Schrank.

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[a] See p. 385.

[b] "Je propose de rétablir ce genre pour quelques espèces de fascioles cylindriques, avec une assez longue queue, et qui ont des espèces d'ailes de chaque côté du corps; j'en ai décrit une trouvée dans le pancréas du Simia maimon de Linné, à l'art. 'fasciole' du Dictionn. des sciences nat."

This name being French, has no status in nomenclature.

ALARIA Schrank, 1788, 52 (m. vulpis) [not Alaria Dunc., 1841, lepidopteron; Morr. Lyc., 1850, mollusk].—Abildg., 1790, 63 (syn. of Dist. vulpina).—Brand., 1888a, 8.—Braun, 1893a, 884, 894, 902.—Dies., 1850a, 307 (syn. of Hemist.).—Encycl. méth., Par., v. 2, 20.—Knoch, 1862, 30.—Lamouroux, 1822a, 194. See also genera for which alata Gœze is type.

vulpis Schrank, 1788, 52 (Planaria alata vel dubia Gœze, 1782a, 176–177, pl. 14, figs. 11–13, from Canis vulpes, renamed).—Brand., 1888a, 60 (syn. of Hemist. alatum).—Dies., 1850a, 308 (syn. of Hemist. alatum; includes also alata Gœze as syn.).—Lamouroux, 1822a, 194.—Rud., 1809a, 402 (syn. of Dist. alatum Zed.).

ALLEGREADIINÆ Engler, 1904, 188, for Allocreadiinæ.

ALLOCREADIIDÆ Stoss., 1904, 199.

ALLOCREADIINÆ Looss, 1902m, 841.—Odhn., 1905, 323, 326, 328.—Stoss., 1902, 578; 1903, 373.

ALLOCREADIUM Looss, 1900d, Dec. 3, 602 (Creadium Looss, 1899 [not Creadium and Creadion Vieill., 1816, bird], renamed, hence type isoporum; ἄλλος, another; 1901b, 199; 1902m, 760, 785, 839.—Braun, 1902b, 26, 147, 148.—Odhn., 1901, 483–520; 1905, 328.—Pratt, 1902a, 888, 897 (key).—Stoss., 1901, 95 (7); 1902, 578; 1903, 373; 1904, 199.

album (Stoss., 1890) Stoss., 1901, 95 (7); 1904, 199 (type of Lepocreadium).

angusticolle (Hausmann, 1896) Odhn., 1901, 517.—Stoss., 1901, 96 (8).

asymphyloporum Stoss., 1901, 96 (in Trutta trutta; Lake Plitvica, Croazia).

atomon (Rud., 1802) Odhn., 1901, 506–513, 516, pl. 33, figs. 9, 10; 1905, 320 (type of Podocotyle).—Stoss., 1902, 582.

commune (Olss., 1876) Odhn., 1901, 499–503, 508, 516, 517, pl. 33, fig. 6; 1905, 327.—Stoss., 1902, 582.

fasciatum (Rud., 1819) Odhn., 1901, 485–490, 492, 496, 516, pl. 33, fig. 1; 1902, 160.

genu (Rud., 1819) Odhn., 1901, 485, 496–499, 500, 501, 502, 517, pl. 33, figs. 3–5; 1905, 327.

isoporum (Looss, 1894) Looss, [1900d, 602;] 1902m, 785.—Kowal., 1902d, 27 (9).—Odhn., 1901, 505, 506, 516; 1905, 327.—Staff., 1904, May 3, 493 (in Semotilus bullaris Raf.; Canada).—Stoss., 1901, 93, 96 (in Gobius fluviatilis; Loitsch in Carniola).

labracis (Duj., 1845) Odhn., 1901, 514–516, pl. 33, fig. 11; 1905, 327.

labri (Stoss., 1886) Odhn., 1901, 490, 493–496, 516, pl. 33, fig. 2; 1902, 160.

obovatum (Mol., 1859) Stoss., 1901, 95–96 (7–8) (in Chrysophrys aurata; Triest).

pegorchis Stoss., 1901, 94–95 (6–7), pl. 6, fig. 4 (Mæna smaris; Triest); 1904, 199.

sinuatum (Rud., 1819) Odhn., 1901, 490–492, 516; 1902, 160.

transversale (Rud., 1802) Odhn., 1901, 505–506, 516; 1905, 327.

tumidulum (Rud., 1819) Odhn., 1901, 503–505, 516, pl. 33, figs. 7–8.

umbrinæ (Stoss., 1885) Odhn., 1905, 327.

AMFISTOMIDI Sons., 1895, see Amphistomidæ.

AMPHIBDELLA Chatin, 1874a, 11–16 (m. torpedinis); 1875, ——.—Braun, 1890a, 412, 417, 444, 468, 484, 512, 519, 523, 542, 545 (diagnosis; m. torpedinis).—Maclaren, 1904, 583, 598, 599, 600.—Mont., 1889, 116; 1903, 336 (syn. of Tetraonchus).—Pratt, 1900a, 646, 654 (key), 657, fig. 47.—St.-Remy, 1898, 524.—Stoss., 1898, 17.

torpedinis Chatin, 1874a, 11–16, pl. 2 (IX), figs. 13–14 (in Torpedo marmorata; Mediterranean).—Brand., 1894a, 307.—Braun, 1890a, 418, 426, 444, 452, 545, 549, 552 (Genoa; Triest).—Maclaren, 1904, 587.—Mont., 1888, 93, 110; 1889, 116 (belongs to Gyrodactylidæ, Tetraonchus); 1890, 193–195 (on Torpedo narce, T. mar.); 1905, 79.—Par., 1894, 138, 578.—Par. & Perugia, 1890, 8; 1890, 363–367; 1890, Sept. 5, 335–336.—Pratt, 1900a, 657, fig. 47.—Stoss., 1898, 17–18 (on T. mar.; Triest).

AMPHIBDELLIDÆ Carus, 1885a, 121 (contains Amphibdella Chatin).—Mont., 1888, 93; 1889, 116 (4) (belongs to Gyrodactylidæ).

AMPHIBOTHRIUM Frey & Leuck., 1847, 147 (m. krœyeri)=Amphibothrium Leuck., 1847, see Braun, 1889a, 343).—Ben., 1858a, 1861a, 12.—Braun, 1890a, 518 (syn. of Udonella, 1855).—Dies., 1850a, 427 (syn. of Udonella Johnston).

krœyeri Leuck., 1847, 147–148, pl. 2, fig. 2 (on Caligus sp. parasitic on Gadus).

AMPHIBOTHRIUM—Continued.

kroyeri Dies., 1850a, 427 for krœyeri (syn. of Udonella caligorum Johnston) (in Caligorum corporis superficie, frequens, in Caligo hippoglossi vulgaris, April (Johnston); C. triglæ Gurnardi, June (Hyndman); C. curto (Kroyer).—Ben., 1858a, 1861a, 13 (syn. of Ud. cal. Johnst.).—Tasch., 1878, 573 (syn. of U. cal. F. & L.).

AMPHIOSTOMA Rud., 1819a, 88 for Amphistoma.

AMPHISTOMA [a] [b] Rud., 1801a, 50–51, 54 (Strigea Abildg., 1790, renamed, hence type strigis=macrocephalum); 1802b, 92–93; 1809a, 5, 21, 37, 340, pl. 5, figs. 4–7 [a, capite discreto, 6 species in birds; b, capite continuo, 3 species in birds, amphibia, and mammals]; 1819a, 87, 351–352, 589.—Baillet, 1866b, 99, 105–106.—Bellingham, 1844a, 338.—Ben. & Hesse, 1864, 61.—Blainv., 1828a, 582–583.—E. Bl., 1847a, 309–310.—R. Bl., 1886m, 841; 1888a, 543, 632, 636; 1895, 730.—Brand., 1888a, 9, 10, 13; 1891d, 12, 20.—Braun, 1883a, 69, 70; 1889i, 437; 1890a, 514, 515; 1892a, 568, 635, 650, 667, 681, 696, 698, 699, 707, 709, 710, 715, 720, 722, 738; 1892f, 49, 50, 51; 1893a, 851, 852, 872, 879, 880, 883, 884, 886, 890, 892, 893, 895, 902, 903, 904, 905, 906, 918; 1893f, 383; 1894a, 1147; 1895b, 134, 136, 137; 1898a, 1583; 1901b, 20, 55, 56 (sp. Bellingham).—Bremser, 1824, 132–133.—Burckhardt, 1891a, 63.—Burm., 1837a, 530; 1856a, 250.—Carus, 1863, 479.—Cobbold, 1875n, Nov., 817 821.—Cohn, 1903, in 35–42.—Crep., 1825a, 35–38; 1837a, 309, 313; 1839a, 286; 1847c, 30–35, pl. 2, figs. 1–5 (2 sp. in Zebu).—Cuv., 1817, 41.—Dav., 1877a, lxxx.—Deslongchamps, 1824c, 53–57.—Dies., 1836d, 238–246 (monograph); 1839a; 1850a, 288, 307 (sub Hemist.), 312 (sub Holost.), 317 (sub Codonocephalus), 318 (sub Diplodiscus), 319 (sub Monost.), 400–407, 573 (sub Tetrabothriorhynchus); 1858c, 312, 322 (of Bellingham, 1844a, 339) (syn. of Holost. falconum), 357–358.—Duj., 1845a, 327–331.—Eichwald, 1829a, 248.—Fil., 1837a, 334, 336.—Fischer, 1840a, 156.—Fischder., 1901a, 367–375 (revision with several new genera); 1902a, 6, 7, 10 (Strigea) (see Paramphist., nomenclature; syn. of Paramphist.); 1903h, 487, (Strigea Abildg., renamed), 488, 489, 490 (type strigis=macrocephalum) (of mammals, revision).—Gamble, 1896a, 73.—Goldb., 1855a, 17.—Goubaux, 1863a, 882–884.—Gurlt, 1831a, 369.—Hahn & Lefevre, 1884, 806.—L'Herminier, 1826, 10.—Hoyle, 1890, 535, 539.—Jackson, 1888, 642, 644, 654.—Joy, 1835a, 504.—Kath., 1894a, 130.—Kholodk., 1898a, 33; 1899a, 153.—Kitt, 1885a, 148.—Lamarck, 1816b, 187–188.—Lamouroux, 1822a, 297.—Leblond, 1836f, 4.—Lejtenyi, 1881a, 3, 9, 11.—Leuck., 1863, 451, 459, 462, 463, 524.—Looss, 1892a, 126; 1894a, 10, 20, 178, 249; 1896b, 173–177; 1901, 622; 1902m, 430, 438, 439, 638, 676, 746, 780 (Paramphist.).—Moniez, 1896, 87.—Mont., 1888a, 7, 12, 30, 46, 47, 52, 56, 63, 64, 71, 83 (Amphist.), 84, 90, 91, 103; 1892, 38; 1892, Oct. 7, 196, 197, 214; 1892, 700, 710; 1893, 27, 108, 208.—Moul., 1856a, 11, 12, 15.—Neumann, 1892, 345.—Nitzsch, 1819, 398–401.—Nord., 1840, 544, 614, 625 627, 628–629.—Olfers, 1816, 22, 47.—Otto, 1896, 78 pp., 30 figs.; 1896, 85–141, 275–296, figs. 1–30 (anat., histology).—Pag., 1857, 52.—Poir., 1883, 79.—Pratt, 1900a, 645.—Rafinesque, 1815, 151 (genus of Filaridia).—Rail., 1892, July 15, 633–634 (of domestic animals in Tonkin); 1893, April 15, 245 246; 1893a, 376 (Strigea).—Rousseau, 1833–34, 149–150.—Schndmhl., 1896, 295, 303.—Schneider, 1866, 334.—Shipley, 1905, 7 (syn. of Strigea), 8 (type Holost. macrocephalum).—Shipley & Hornell, 1904, 80.—Sons., 1895, 181, 183, 184, 185, 186.—Stiles, 1898a, 24, 64.—Tasch., 1879, 232, 233, 256.—Vaullegeard, 1899, 53.—Vogt, 1878, 9, 10.—Wallenstedt, 1847, 7.—Ward, 1895, 256, 338 (sp. Cobb. in stomach of Equus caballus).—Westrumb, 1821, 46; 1823, 390–398, pl. 5, figs. 1–2.

1803: Amphystoma Rud., 1803a, 29 (misprint).

1819: Amphistomum Nitzsch, 1819, 397–401 (emendation).—Crep., 1825, 35; 1837, 309, 313.

1819: Amphiostoma Rud., 1819a, 88 (misprint).

1822: Amphistome Lamouroux, 1822a, 297 (French word or misprint).

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[a] Rud. deliberately renamed a previously validly named genus, namely Strigea Abildgaard, 1790, referring clearly to this fact both in 1801a, 50–51, and 1802b, 92. He makes but one combination (Amphist. subclavatum), but since Amphist. is clearly a new name proposed for an older one (Strigea), which Rud. changed on the alleged ground that it was inappropriate, Amphist. should be suppressed in favor of Strigea and take the same species as type.

[b] Since 1816 written almost indiscriminately Amphistoma or Amphistomum.

AMPHISTOMA—Continued.

1888: Amphistomun Mont., 1888, 83 (misprint).

anatis Rud., 1819a, 793, for anatis querquedulæ 1819a, 92.

anatis querquedulæ Rud., 1819a, 92 (in Anas querquedula; **C. E. V.**).—Dies., 1836d, 253.—Westrumb, 1823, 398.

anatis tadornæ (Viborg, 1795) Rud., 1809a, 352; 1814a, 100 (=A. isostomum).—Dies., 1850a, 313 (syn. of Holost. erraticum Duj.).

asperum Dies., 1838a, 189 (in Tapirus americanus); 1839a, 236, pl. 20, figs. 14–16 (in Tap. amer.; South America [Matogrosso and Cachoeira do Bananeira]); 1850a, 402.—Braun, 1892a, 580; 1893a, 894, 905; 1893d, 466.—Cobbold, 1875n, 819; 1879b, 402.—Duj., 1845a, 334.—Fischder., 1902a, 39 (syn. of Cladorchis asper).—Nord., 1840, 629.—Sons., 1895, 184.

attenuatum Dies., 1836d, 238, 252, pl. 24, figs. 9–12 (in Salmo paccu; Caiçara); 1850a, 406–407 (in Miletes bidens; Brazil).—Cobbold, 1860a, 54 (in M. bidens; Brazil).—Duj., 1845a, 341 (in Salmo pacu; Brazil).—MacCallum, 1905, 668, 677 (in Salmo).—Nord., 1840, 629.

bothriophoron Braun, 1892f, 49, 50, 51 (in Bos indicus; Madagascar); 1893a, 738; 1893b, 185; 1893f, 383; 1901b, 20.—Fischder., 1903h, 538 (to Paramphist.).—Otto, R., 1896, 101–103, fig. 5.—Sons., 1895, 184.—Spengel, 1892.

bothriophorum Stiles, 1898a, 24, 67, fig. 56 (read bothriophoron).

brachycœlium Cohn, 1903, 39 (host not given) (? lapsus).

cervi (Schrank, 1790) Stiles, 1898a, 24, 64, 65, 66, 67, 139, 140, 141, 142, figs. 49–55 (Bos taurus).—Fischder., 1901a, 368 (type of Paramphist.).—Stiles & Hass., 1900a, 611, fig. 29; 1902f, 360; 1904c, 22.

cheloniæ imbricatæ Dies., 1858e, 358 (based on Bellingham, 1844a, 340, in Chelonia imbricata; Ireland).—Braun, M., 1893a, 905.

chordale Burckhardt, 1891a, 21 Apr., 62–64 (Protopterus annectens); 1892a, 344–345 (a Tetracotyle, Holostomidæ, teste Brandes).

clavatum Steenstrup, 1842, 59 (in Rana temporaria); 1842, 109–110 [for subclavatum?].—Sieb., 1843, lx.

clavigerum Zed., 1803a, 199 (Fest. strigis Schrank, 1788, renamed)(in Strix).—Rud., 1809a, 341 (syn. of A. macrocephalum).

collinsi Sons., 1895, 182 (for collinsii), 187 to (Pseudodiscus).—Fischder., 1902a, 48 (in Equus caballus; India).

collinsii Cobbold, 1875l, 741 (in Equus caballus); 1875n, 818, 819; 1879b, 357, 398; 1883x, 515.—Fischder., 1903h, 489 (to Pseudodiscus by Sons.).—Huber, 1896a, 580 (India).—Sons., 1895, 182, fig. 2.—Theobald, 1900, 51.

collinsii var. *stanleyi* Cobbold, 1879b, 357 for stanleyii 1875 (in Equus).—Fischder., 1902a, 48.—Piana & Stazzi, 1900, 519 [= A. hawkesi Cobbold].—Sons., 1895, 182.

conicum (Zed., 1803) Rud., 1809a, 349–352 (Bos taurus, Greifswald; Cervus elaphus), 356; 1819a, 91 (Ovis aries, Cervus dama), 360, 577, 589, 793.—Anacker, 1892c, 94.—Baillet, 1866b, 90, 106.—Bénion, 1874a, 628.—Bettendorf, 1897a, 7, 38; 1897, 311, 342.—E. Bl., 1847a, 310–316.—R. Bl., 1886, 295; 1888a, 584, 585.—Blumberg, 1871a, 40 pp., 1 pl. (anat.); ———, 496–499; 1872, v. 33, 190–191; ———, v. 8, 454.—Brand., 1891d, 7, 12, 13, 14, 15, 18, 20; 1898a, 222 (30).—Braun, 1892, 49, 50; 1892a, 576, 584, 587, 589, 591, 593, 595, 596, 597, 601, 603, 607, 608, 609, 613, 614, 615, 621, 622, 628, 632, 638, 640, 641, 642, 645, 646, 648, 654, 660, 661, 662, 664, 666, 667, 669, 671, 675, 676, 677, 681, 682, 683, 685, 688, 692, 693, 695, 703, 705, 711, 712, 713, 717, 718, 719, 724, 729, 730, 731, 733, 738, 739, 748, 762, 766; 1893a, 874, 879, 881, 905; 1893b, 186; 1893d, 466.—Cobb, 1891b, 614–615, 1 fig.—Cobbold, 1858b, 159; 1859, 51; 1875n, 818; 1879b, 331; 1884g, 976.—Conyngham, 1904, Sept. 17, 663.—Crep., 1837a, 311, 313, 315, 317, 321, 322, 323, 327; 1839a, 286; 1841, 80; 1847, 30.—Darr, 1902, 688.—Daubenton, ———, 250, pl. 16, fig. 3 (Bos taurus).—Dav., 1877a, lxxx, 234, 235.—Dies., 1835, 246; 1836d, 238, 239, 240, 243, 244, 245, 246–248, pl. 23, figs. 1–4 (Bos taurus dom., Ovis aries, Cervus elaphus, Cervus capreolus, Cervus dama, Cervus campestris, Cervus dichotomus, Cervus nambi, Cervus rufus, and Cervus simplicicornis; Brazil); 1850a, 401 (in Bos taurus indicus, Berlin; B. urus, Vilna; Capra hircus var.; Antilope dorcas, Berlin; Cervus capreolus; C. alces) (syns.: Fasc. hepatica Mueller; F. cervi Schrank; F. elaphi Gmelin; Festuc. cervi Zed., Monost. conicum Zed.); 1850a, 401.—Duj., 1845a, 331, 332–333.—Eichw., 1829a, 248.—Falk, ———, 6–7.—Fischer,

AMPHISTOMA—Continued.

1840, 157; 1883a, 20.—Fischder., 1901, 368, 375; 1902a, 11 (syn. of Paramphist. cervi), 13 (syn. of P. liorchis), 41, 50 (syn. of Balanorchis anastrophus); 1903h, 485 (in Bos taurus; Kœnigsberg i. Pr.), 504–505 (syn. of P. cervi), 506, 508 (of Dies., 1835, 247, in Cervus dichotomus in Brazil as syn. of Bal. anast.), 508 (of Dies., 1835, 247, in Cervus simplicicornis, C. campestris, C. mexicanus, C. rufus, C. dichotomus, C. namby in Brazil as syn. of P. liorchis), 509 (of Gurlt, 1831, 369 in Bos taurus indicus as syn. of P. dicranocœlium), 515 (of Dies., 1835, 247, in South American Cervus simplicicornis, campestris, mexicanus, rufus, dichotomus, namby, as syn. of P. liorchis), 528 (in B. tau. ind., as syn. of P. dicranocœlium), 535 (in Antilope dorcas as syn. of P. microbothrium), 584 (syn. of Gastrothylax mancupatus); 1904, 459.—Giard & Billet, 1892a, 615.—Giebel, 1857, 266.—Gronkowski, 1902a, 511, 514, 515, 517–518, 519, 520, 523, 529–531, 532, 533, fig. A (4, 7, 8, 10–11, 12, 13, 16, 22–24, 25, 26, pl. 13, figs. 2, 6, 7).—Gurlt, 1831, 156, 369–370, pl. 8, figs. 25–28.—Janson, 1893c, 261; 1897a, 103.—Kastenbaum, 1899 (244), fig. 33, 6.—Kath., 1894a, 131, 143.—Kerbert, 1881a, 548, 551.—Kitt, 1885a, 148.—Lamarck, 1816b, 189.—Lamouroux, 1822a, 297.—Laurer, J. F., 1830a, 20 pp., 1 pl.; 1830, 3, 4, figs. 1–14.—Lejtenyi, 1881a, 3, 5, 6, 7, 8, 11, 16, 18, 20.—R. Leuck., 1863, 479, fig. 157; 1876, 869.—Linst., 1883, 310.—Looss, 1885b, 6, 17; 1894a, 124, 142, 146, 206, 237; 1894d, 17, 22, 24; 1896b, 5, 23, 31, 32–33, 170, 173, 176, 178, 185–191, pl. 12, figs. 125–134 (syn. Fest. cervi) (in Physa alexandrina; P. micropleura; buffles; Egypt); 1898a, 459; 1902m, 438, 444 (Cerc. pigmentata Sons.), 638.—Macé, 1882, 9, 30, 80, 81, 85.—Mégnin, 1882, 456.—Mingazzini, 1899a, 10 pp., figs. 1–5.—Miram, 1840, 157.—Moul., 1856a, 18.—Mueh., 1898, 20.—Neumann, 1888, 336, fig. 124; 1892, 353, fig. 140; 1892, 363, fig. 140.—Nitzsch, 1819, 398 (syn. Monost. conicum Zed.).—Nord., 1832a, 38, 92, 93, 97; 1840, 547; 1840, 627 (syns. Fasc. elaphi Gmelin; Monost. conicum Zed.).—Olfers, 1816, 47.—Ostertag, 1899, 412.—Otto, 1896, 97–101, fig. 4, figs. 10, 13.—Poir., 1885, 1, 3, 101, 102.—Rail., 1886, 301, fig. 195; 1890, 143; 1892, 633; 1893a, 376–377 (synonymy), fig. 249.—Rail. & Gomy, 1899, 348, 349.—Rubridge, 1892, 61.—Schmalz, 1831, 24.—Schneider, 1866, pl. 28, fig. 4.—Siebold, 1835, 56, 57, 58, 59, 62, 65.—Slawikowski, 1819, 52.—Sons., 1895, 181, 184, 185; 1896, 314; 1897, 252.—Staff., 1905, April 11, 693 (syn. of Paramphist. cervi Zed.).—Stiles, 1898a, 64.—Tasch., 1878, 176.—Trollip, 1893, 6 (22), 2. Nov., 424–425 (in ox).—Verrill, 1870, 176, 177, 220.—Veterinarius, v. 21, 328.—Villot, 1878, 16.—Volz, 1899, 232.—Ward, 1895, 256 (syns. Fest. cervi Zed.; Fasc. elaphi Gmelin; Monost. conicum Zed.); 1895, 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus).—Westrumb, 1823, 396, 397.—Zeit. f. Fleisch-u. Milchhyg., July, 1894, 200.—Ziegler, 1883, 546.—Zuern, 1882, 220, 221, pl. 4, fig. 10.—Also reported for Capreolus caprea, Cariacus paludosus.

cornu (Zed., 1800) Rud., 1809a, 346–347 (Ardea cinerea; Europe); 1819a, 85, 345, 793 (to Monost.).—Brand., 1888a, 10.—Dies., 1850a, 327 (to Monost.). Duj., 1845a, 349 (to Monost.).—Lamarck, 1816b, 189.—Nord., 1840, 626–627.—Olfers, 1816, 48.

cornu (Nitzsch, 1819) Rud., 1819a, 89–90, 357, 793 (Ardea cinerea, A. garzetta; Europe) [nec (Zed., 1800) Rud., 1809].—Baird, 1853a, 47.—Bellingham, 1844, 339.—Dies., 1850a, 315 (to Holost.); 1858e, 321.—Stoss., 1898, 22 (to Holost.).—Westrumb, 1823, 394–395.

cornu Dies., 1839a, 235, pl. 20, figs. 12–13 (Dorcas n. sp.=Cataphractus vacu Natt. Cat.; Forte do Rio Branco, Brazil) [nec (Zed., 1800) Rud., 1809a; nec (Nitzsch 1819) Rud., 1819]; 1850a, 402.—Braun, 1893a, 905.—Cobbold, 1860a, 53 (renamed nattereri).—Duj., 1845a, 340.—MacCallum, 1905, 668.

cornutum Rud., 1808a, xxv, pl. 4, figs. 4–7; 1809a, 343–344 (in Charadrius pluvialis, intestine; Greifswald); 1819a, 90, 589, 793.—Dies., 1850a, 317 (to Holost.).—Duj., 1845a, 372 (to Holost.).—Lamarck, 1816, 188.—Lamouroux, 1822a, 297.—Nord., 1840, 626.—Olfers, 1816, 47.—Risso, 1826, 262.—Westrumb, 1823, 395.

rumeniferum Crep., 1847, 30–34, pl. 2, figs. 1–5 (in Bos taurus indicus, rumen).—Baillet, 1866b, 106.—Brand., 1891d, 17; 1898a, 196, 216 (4, 24).—Braun, 1892a, 576, 738, 739; 1892, 49, 51.—Cobbold, 1875m, 819; 1879b, 332.—Dav., 1877a., lxxx.—Dies., 1850a, 402–403.—Fischder., 1902a, 27 (to Gastrothylax); 1903h, 488, 557 (type of Gastrothylax), 558, 559, 575; 1904, 459.—Giard & Billet, 1892a, 615.—Neumann, 1892, 363.—Poir., 1883, 76 (to Gastrothylax).—Sons., 1895, 185; 1896, 298.—Stiles, 1898a, 67.—Verrill, 1870, 177, 220.—Ward, 1895, 332 (in Bos taurus).

AMPHISTOMA—Continued.

crumigerum Fischder., 1903h, 563 (syn. of Gastrothylax compressus Brand.).

cylindricum Dies., 1836d, 249, pl. 23, figs. 13–15 (in Cataphractus murica; at Villa Maria, Brazil); 1850a, 405 (in Doras murica; Brazil).—Braun, 1893a, 905.—Duj., 1845a, 340.—MacCallum, 1905, 668, 672, 673 (in Callichthys).—Nord., 1840, 628.

denticulatum Rud., 1819a, 90, 358 (in Alcedo ispida; Mus. Vien.), 793.—Dies., 1850a, 311 (to Hemist.).—Duj., 1845a, 372 (to Holost.).—Lamouroux, 1822a, 297.—Villot, 1898, 538.—Westrumb, 1823, 395–396.

dolichocotyle Cohn, 1903, May 30, 37–39, fig. 3 (in Herpetodryas fuscus); 1904, 242.—Type of Catadiscus, 1904.

elongatum (Poir., 1883) Fischder., 1903h, 577 (to Gastrothylax) (in Anoa depressicornis; Berlin Zool. Garden).

emarginatum Dies., 1839a, 237 (in Callithrix noctivaga; at Matogrosso, Brazil); 1850a, 407 (in Cebus trivirgatus), ex Dies., 1839.—Braun, 1893a, 905; 1901e, 311.—Cobbold, 1879b, 289.—Duj., 1845a, 331 (ex Dies., 1839).—Fischder., 1902a, 49 (in Nictipithecus trivirgatus; Brazil).—Nord., 1840, 629.

emberizæ citrinellæ Dies., 1836d, 253.

erraticum Rud., 1808a, 458 (nomen nudum); 1809a, 344–345 (in Larus septentrionalis; Greifswald, Europe); 1819a, 89 (in Scolopax gallinago, Greifswald; Colymbus arcticus, Scolopax rusticola), 356, 793.—Baird, 1853a, 47 (to Holost.).—Crep., 1839, 288.—Dies., 1850a, 313 (to Holost.).—Duj., 1845a, 373 (to Holost.).—Erc., 1881e, 86 (eggs); 1882a, 322.—Lamarck, 1816b, 189.—Lamouroux, 1822a, 297.—Nord., 1840, 626.—Olfers, 1816, 47.—Westrumb, 1823, 393–394.

excavatum (Rud., 1803) Nitzsch, 1819, 399 to (Holost.).

explanatum Crep., 1847, 34–35 (in Bos taurus indicus, liver and gall bladder; Berlin).—Baillet, 1866b, 106.—Braun, 1892a, 738; 1893a, 875, 905; 1893d, 467 (in Bos taurus indicus).—Cobbold, 1875n, 819; 1879b, 332.—Dav., 1877a, lxxx.—Dies., 1850a, 404–405 (Berlin).—Fischder., 1902a, 34 (in Bos taurus ind.; Calcutta); 1904, 454, 459.—Giard, & Billet 1892a, 615.—Gomy, 1897a, 377.—Rail. & Gomy, 1897, 2 July, 610–613 (in cattle; Cochin China); 1897, 1 Aug., 474–475; 1899, 347, 349.—Sons., 1895, 184.—Stiles, 1898a, 24, 67, 140.—Verrill, 1870, 177.—Veterinarius, v. 21, 328.—Ward, 1895, 332 (in Bos taurus).

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falconis palumbæ Baird, 1853a, 47 (syn. of Holost. macrocephalum).

falconis palumbarii Rud., 1819a, 88 (syn. of A. macrocephalum), 793.—Dies., 1850a, 309 (syn. of Hemist. spathula).

falconis palumbi (Viborg, 1795) Rud., 1809a, 352, sp. inq.

falconis peregrini Rud., 1819a, 92, 362, sp. dub. (Falco peregrinus; Berlin), 793.—Dies., 1836d, 253.—Westrumb, 1823, 397.

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giganteum Dies., 1836d, 238, 239, 240, 243, 244, 245, 248, pl. 22, figs. 5–6 (Dicotyles albirostris at Nas Frechas and Caiçara, and D. torquatus at Matogrosso); 1850a, 403.—Brand., 1891d, 17.—Braun, 1892a, 578, 601; 1893a, 874, 905; 1893d, 466 (in Dic. labiatus; D. torq.).—Cobbold, 1875n, 819; 1879b, 404.—Crep., 1841, 80 (in Dic. lab., D. torq.).—Duj., 1845a, 333–334.—Fischder., 1901, 373; 1902a, 40 (e. p. syn. of Cladorchis (Taxorchis) schistocotyle).—Moul., 1856a, 19.—Nord., 1840, 547, 628.—Sons., 1895, 184.

gigantocotyle Brand., in Otto, 1896, 16 Apr., 103–105, figs. 6–7 (in Hippopotamus).—Fischder., 1902a, 9, 34 (in Hip. amphibius; Africa); 1903h, 495, 496.

gracile Rud., 1819a, 89, 355 (Mergus merganser and M. albellus), 793.—Bellingham, 1844, 339.—Dies., 1850a, 315 (to Holost.); 1858e, 321.—Duj., 1845a, 578 (to Holost.).—Lamouroux, 1822a, 297.—Westrumb, 1823, 393.

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grande Dies., 1839a, 237, pl. 20, figs. 25–27 (in Chelys, Phrynops, Peltocephalus, Podocnemis, Rhinemys; South America); 1850a, 406 (in Chelys fimbriata, Phrynops geoffroanus, P. miliusii, P. gibbus, Peltocephalus dumerilianus, Podocnemis erythrocephala, P. expansa, P. tracaxa, Rhinemys nasuta; Brazil).—Brand., 1891d, 17.—Braun, 1892a, 586; 1893a, 879, 905; 1899b, 715, 719; 1901b, 55.—Crep., 1844a, 114.—Duj., 1845a, 336.—Leidy, 1888, 127.—Looss, 1902m, 430, 437, 440.—Mont., 1892, 715; 1896, 165.—Nord., 1840, 629.

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hawkesi Braun, 1893d, 466, for hawkesii Cobbold.

hawkesii Cobbold, 1875n, 818, 819 (in Elephas indicus; India); 1877, 234; 1879b, 393, 396, 399; 1882, 238–240, fig. 8; 1883x, 515.—Braun, 1893a, 874, 905; 1893d, 466 (hawkesi).—Fischder., 1902a, 48 (hawkesi) (in E. indicus, India); 1903h, 489 (to Pseudodiscus by Sons., 1895).—Galli-Valerio, 1901c, 364 (elephant).—Huber, 1896a, 579–580 (elephant).—Looss, 1902m, 439 (hawkesi).—Mégnin, 1882, 455.—Piana & Stazzi, 1900, 511, 519–525, 529, figs. 12–14 (hawkesi); 1901, 416.

hepaticum Betegh in Gomy, 1898, 328–329 [Veterinarius, v. 21 (11), June 1]; [Gomy, 1897, Aug. 21, 401].—Rail. & Gomy, 1899, 348.—Refers to "amphistome hépatique" =A. explanatum.

hirudo Dies., 1836d, 238, 249, pl. 23, figs. 10–12 (Palamedea cornuta; Engenho do Cap Gama, Brazil); 1850a, 407.—Braun, 1893a, 874, 905.—Duj., 1845a, 355.—Nord., 1840, 628.

hominis Lewis & McConnell, 1876a, 182–186, 1 text fig., pl. 3, figs. 1–3 (Homo; Calcutta, India).—Anders, 1903, 1245.—Bl., 1888a, 632–636, figs. 327–329; 1895, 744; 1900, 488.—Braun, 1883, 69: 1892a, 663; 1893a, 874, 905; 1895, 137–138, fig. 52; 1903, 146 (to Gastrodiscus).—Cobbold, 1879, 36–38, fig. 6; 1883x, 515.—Dav., 1877a, cxxxii.—Dunglison, 1893, 50, 533.—Fischder., 1901, 374; 1902a, 9, 46 (to Gastrodiscus); 1903h, 496.—Gamb., 1896, 63.—Giles, 1890, 125.—Hackley, 1886, 519.—Huber, 1896, 579–580.—Ijima, 1889, 157.—Jamison, 1897a, 74.—Kholod., 1898, 33, pl. 11, figs. 26–27; 1899a, 153.—Looss, 1902, 746; 1905, 110 (to Gastrodiscus).—Manson, 1901, 541, 543; 1903, 3. ed., 663, fig. 106.—Mon., 1896, 86, 87–89, figs. 17–18.—Mosler & Peiper, 1894, 185–186.—Schneidemuehl, 1896, 303.—Simon, 1897, 209; 1897, 223–224.—Sons., 1895, 181, 183; 1895, 187, fig. 6 to (Gastrodiscus); 1896, 310.—Stiles, 1904, 46 (to Gastrodiscus).—Veterinarian, Lond., 1877, v. 50, 82.—Vogt, 1878, 10.—Ward, 1895, 327 (in Homo); 1903, 865 (to Gastrodiscus).

isostomum Rud., 1814a, 100 (Strigea candida and Amphist. anatis tadornæ, renamed; in Anas tadorna; Copenhagen); 1819a, 89, 355, 793.—Bellingham, 1844a, 339.—Duj., 1845a, 377 (to Holost.).—Dies., 1850a, 313 (syn. of Holost. erraticum); 1858e, 320.—Lamouroux, 1822a, 297.—Olfers, 1816, 48.—Westrumb, 1823, 393.

konikum Schneidemuehl, 1896, 303, for conicum.

lari glauci Rud., 1819a, 92 (in Larus glaucus; Cat. Ent. Vien.), 793.—Dies., 1836d, 253; 1850a, 310 (syn. of Hemist. spathaceum).

loliginis delle Chiaje, 1841a, 140 (sub Amphystoma).—Par., 1894.

longicolle Rud., 1819a, 87–88, 92, 352–353 (Ardea alba, A. stellaris, Larus ridibundus, and L. atricilla; Mus. Vienn.), 793.—Baird, 1853a, 48 (to Holost.).—Bellingham, 1844, 338.—de Blainv., 1828, 583.—Bremser, 1824, 132; 1824c, pl. 8, figs. 15–16.—Dies., 1850a, 316 (to Holost.); 1858e, 321.—Fischer, 1840, 157.—Lamouroux, 1822a, 297.—Stoss., 1898, 21.—Westrumb, 1823, 390–391.

lunatum Dies., 1836d, 238, 240, 250–251, pl. 23, figs. 21–22 (Cervus dichotomus, Anas melanotus, Anas ipecutiri, Himantopus wilsonii; Caiçara); 1850a, 405–406 ("Cervus dichotomus, nisi lapsus calami;" other hosts as in 1836d).—Braun, 1892a, 570; 1893a, 874, 905.—Crep., 1839, 286.—Duj., 1845a, 335–336.—Fischder., 1902a, 53–54 in Cervus dichotomus?, Anas ipecuteri, A. himantopus, A. melanotus, A. moschata fer.; Brazil).—Nord., 1840, 629.—Also reported for Cariacus paludosus.

macrocephalum Rud., 1803a, 21–23 (Strix bubo) (includes: Fasc. strigis Gmelin, 1790a, and Strigea Abildg., 1790 [Copenhagen]) [type of Amphist., by inclusion]; 1809a, 50, 340–342 (in Strix ulula, S. otus, S. bubo, S. flammea, Scolopax gallinago); 1814a, 99–100; 1819a, 88 (additional hosts: Falco albicilla, F. aluco, F. apivorus, F. buteo, F. chrysaëtos, F. cineraceus, F. cyaneus, F. gallicus, F. haliaëtos, F. lagopus, F. lanarius, F. leucosoma, F. lithofalco, F. milvus,

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F. nævius, F. nisus, F. palumbarius, F. pennatus, F. peregrinus, F. rufipes, F. subbuteo, F. tinnunculus, Strix brachyotus, S. dasypus, S. passerina), 354–355 (includes Holost. variabile Nitzsch, and Fest. oti), 793.—Baird, 1853a, 47, 48 (to Holost.).—Bellingham, 1844a, 338.—Brand., 1888a, 10.—Bremser, 1824, pl. 8, figs. 18, 19, 21, 22.—Cobbold, 1858b, 164 (syn. of Hemist. spathula Dies., see next entry).—Crep., 1839, 288.—Dies., 1850a, 312–313 (A. mac. of Rud., 1809a, 340; 1819a, 88, exc. syn.; Westrumb, 1823, 391; Bremser, 1824, pl. 8, figs. 18, 19, 21, 22, all as syn. of Holost. variabile); 1858e, 320 (syn. of Holost. variabile).—Fischer., 1840, 157.—Fischder, 1901, 367; 1902a, 7 (=Plan. strigis); 1903h, 490 (=strigis; type of Strigea, Amphist., Holost.).—Lamarck, 1816, 188.—Lamouroux, 1822a, 297.—Nitzsch, 1819, 400 (syn. of Holost. variabile).—Nord., 1840, 625 (syns. Fasc. strigis, Holost. variabile).—Olfers, 1816, 47.—Stoss., 1898, 21 (syn. of Holost. variabile).—Westrumb, 1823, 392–393.

macrocephalum Rud., 1819a, 88 (pars; falconis milvi).—Baird, 1853a, 48.—Bremser, 1824, pl. 8, figs. 17, 20.—Dies., 1850a, 309 (syn. of Hemist. spathula).—Linst., 1905, 191.—Nord., 1840, 626 (syn. of A. striatum).

megacotyle Dies., 1836d, 238, 250, pl. 23, figs. 19–20 (Silurus palmito; Matogrosso); 1850a, 405 (Trachicirrhus nattereri; Brazil).—Braun, 1893a, 905.—Duj., 1845a, 340 (in Sil. palm.; Brazil).—MacCallum, 1905, 668 (in Silurus).—Nord., 1840, 629.

microcephalum Rud., 1819a, 88, lapsus for A. microstomum Rud.

microstomum Rud., 1809a, 342–343 (Corvus caryocatactes; Europe); 1819a, 88, 793.—Dies., 1850a, 314 (to Holost.); Duj., 1845a, 371 (Greifswald), (to Holost.).—Lamouroux, 1822a, 297.—Olfers, 1816, 47.—Westrumb, 1823, 393.

mutabile (Zed., 1800) Sieb., 1835, 70, lapsus for Monost. mut.

nattereri Cobbold, 1860a, 52; cornu Dies., 1839a [not (Zed., 1800) Rud., 1809], renamed; t. h. Callichthys vacu; Brazil.

oidemiæ nigræ Dies., 1858e, 322 (syn. of Holost. anatis nigræ), based on Bellingham, 1844a, 340, Ireland.

ornatum Cobbold, 1882a, March, 240, fig. 9 (Elephas indicus).—Braun, 1893a, 882, 905.—Fischder., 1902a, 49 (in Elephas indicus; India).—Looss, 1902m, 439.—Mégnin, 1882v, 454–456 (in elephant).—Sons., 1895, 183.

oxycephalum Dies., 1836d, 238, 240, 251, pl. 24, figs. 1–8 (Salmo auratus, S. pacu, Silurus megacephalus at Cuyaba, Salmo pacupeba at Rio Panara and Rio Araguay); 1850a, 407.—Braun, 1892a, 586; 1893a, 905.—Duj., 1845a, 339–340.—MacCallum, 1905, 668, 672 (in Salmo and Silurus).—Nord., 1840, 629.

papillatum Cobbold, 1882, 240–242, fig. 10, pl. 24, fig. 11 (Elephas indicus).—Braun, 1892a, 580, 663; 1893a, 874, 905; 1893d, 466.—Fischder., 1902a, 49 (in Elephas indicus; India).—Sons., 1895, 184, 187, figs. 4–5.

papilliferum Braun, 1892a, 586, for A. papillatum Cobbold.

pileatum (Rud., 1802) Rud., 1819a, 90, 358, 793.—Blainv., 1828, 584 (to Holost.).—Dies., 1850a, 314 (to Holost.).—Lamouroux, 1822a, 297.—Westrumb, 1823, 395.

pileatum Rud., of Bremser, 1824, pl. 8, figs. 28–29.—Dies., 1850a, 311 (syn. of Hemist. commutatum).

piriforme Sons., 1895, 184 (for pyriforme).

platycephalum Crep., 1825a, 39–41, 81–82 (Colymbus rufogularis; Greifswald); 1846, 138, 139, 140, 141.—Dies., 1850a, 313 (to Holost.).—Duj., 1845a, 376 (to Holost.).

pulcherrima Weyenbergh, 1876, 167–169, pl. 9, figs. 75–78 (in Hypostomus plecostomus Val.; Argentina); 1878, 354 (to Dist.).—Looss, 1885b, 55.

pyriforme Dies., 1838a, 189 (in Tapirus americanus); 1839a, 236, pl. 20, figs. 17–18 (Tap. amer.; Matogrosso or Cachoeira do Bananeira); 1850a, 403 (Brazil).—Braun, 1893a, 874, 905; 1893d, 466 (in Tap. amer.).—Cobbold, 1875n, 819; 1879b, 402.—Duj., 1845a, 334.—Fischder., 1902a, 36 (to Cladorchis).—Nord., 1840, 629.—Sons., 1895, 184 (piriforme).—Weyenbergh, 1878, 167–169.

rhopaloides Crep., 1839, 294; 1846, 168 ("falsch geschrieben ropaloides" Leblond).—Baird, 1853a, 116 (syn. of Tetrabothriorhynchus barbatus).—Dies., 1850a, 574 (syn. of Tetrab. migratorius in Conger vulgaris) (includes Leblond, 1836e, 290, pl. 16, figs. 1–3; 251.—Deslongchamps,——, 294.—Duj., 1845a, 341.—Sieb. 1837, 265; 1838, 306).—Lacaze-Duthiers, 1854a, 294.

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sclcroporum Rud., of Brand., 1891d, 19 (for Creplin?).

scleroporum Crep., 1844a, 112–115, pl. 3, fig. A (Chelonia mydas); 1846, 146.—Braun, 1893a, 905; 1899b, 715 (in Chelone viridis), 725 (C. mydas); 1901a, 39, 40, 55, 56, 1 fig.—Dies., 1850a, 406 (Halichelys atra; Vratislaviæ).—Looss, 1901, 623, 624; 1902m, 430, 437, 438, 440, 562.—Mont., 1896, 165.—Walter, 1892, 248.

serpens (Nitzsch, 1819) Rud., 1819a, 88, 353–354 (in Falco haliaëtus; September), 793.—Dies., 1850a, 316 (to Holost.).—Duj., 1845a, 371, at Halle (to Holost.).—Lamouroux, 1822a, 297.—Nord., 1840, 628 (to Holost.).—Westrumb, 1823, 392.

sonsinoi Linst., 1889, 23 (for sonsinoii) (in Equus caballus).—Ward, 1895, 338, (syn. of Gastrodiscus ægyptiacus) (in Equus caballus).

species Bellingham, 1844, 340.—Braun, 1901a, 55, 56.—Looss, 1902m, 430.

species Cobbold, 1879, in Equus caballus.—Ward, 1895, 338.

species Fischder., 1903, v. 17, 594; 1904, 468, syn.? of Paramphist. scoliocœlium.

species in Felis catus.

species in Phoca grœnlandica.

sphærocephalum Westrumb, 1823, 396 (Coracias jugularis; at Rio Janeiro).—Brandes, 1888a, 65 (to Holost.); 1890a, 592.—Dies., 1850a, 314 (to Holost.; in Coracina scutata; Brazil).

sphærula Rud., 1803a, 23–24 (Corvus cornix; Greifswald); 1809a, 345–346; 1819a, 90, 358.—Bellingham, 1843a, 343; 1844, 339.—Dies., 1850a, 314 (to Holost.).—Duj., 1845a, 371 (to Holost.).—Lamouroux, 1822a, 297.—Olfers, 1816, 47.—Westrumb, 1823, 395.

spinulosum Looss, 1901l, 7 Nov., 623–624 (in Chelone mydas; Alexandria, from Egyptian coast); 1902m, 415, 430–444, pl. 21, figs. 10, 11; pl. 22, figs. 12–16, 430, 434, 436, 437, 438, 439, 442, 649, 676, 869 (colon of Ch. mydas), 871.—Shipley, 1905, v. 2, 846.

stanleyi (Cobbold, 1879) Ward, 1895, 338 (in Equus caballus) (for stanleyii Cobbold).

stanleyii Cobbold, 1875n, 819.—Fischder., 1902a, 48 (stanleyi) (in Equus caballus; India).

striatum Rud., 1809a, 343 (Falco milvus; Europe); 1819a, 88 (syn. of A. macrocephalum, 793.—Baird, 1853a, 47 (syn. of Holost. macroceph.).—Dies., 1850a, 309 (syn. of Hemist. spathula).—Lamarck, 1816b, 188.—Nord., 1840, 626 (syn. A. macroceph. Rud.).—Olfers, 1816, 47.

subclavatum (Gœze, 1782) Rud., 1802b, 92–93; 1809a, 348–349 (in Rana temporaria, R. bufo, R. arborea, R. esculenta); 1819a, 90–91 (in Bufo igneus, B. cinereus), 358–359, 589, 793.—Baillet, 1866b, 96 (of Nitzsch).—Ben., 1858a, 1861a, 81–84, 171, 203, 215 (syns. Plan. subclavata, Dist. subclavatum, Diplodiscus subclavatus, Dip. diesingii, Diplocotyle mutabile).—Bettend., 1897a, 8, 37; 1897, 312.—Blainv., 1828a, 53.—E. Bl., 1847a, 316–317, pl. 14, fig. 1.—Brand., 1891d, 17.—Braun, 1892a, 592, 798; 1893a, 845, 848, 851, 852, 854, 858, 864, 869, 874, 879; 1893b, 177, 179, 180, 182; 1895b, 11.—Bremser, 1824c, pl. 8, figs, 30–31; 1824, 133.—Cobbold, 1872b, 91 (to Diplodiscus); 1879b, 49, 452, 454.—Crep., 1839a, 286.—Creutzburg, 1890a, 21.—Darr, 1902a, 678, 688.—Dies., 1836d, 237, 238, 240, 253 (to Diplodiscus); 1850a, 318 (in Dendrohyas viridis, Rana temporaria, Pelophylax esculentus, Phryne vulgaris, Bufo viridis, Bombinator igneus, Leptodactylus sibilatrix); 1858e, 360, 1859c, 435.—Duj., 1845a, 336, 339 (in Rana esculenta; Rennes).—Erc., 1881e, 57 (embryo), pl. 2, fig. 9; 1882a, 293.—Fil., 1837a, 338 (syn. Diplodiscus subcl.); 1854a, 6; 1855b, 13–17, pl. 2, figs. 14–16 (in Planorbis vortex; Moncalier); 1857c, 32.—Fischder., 1903h, 487 (to Diplodiscus by Dies.).—Fraip., 1880c, 419.—Gerv. & Ben., 1859b, 212.—Gronkowski, 1902a, 515 (8).—Hoyle, 1890, 539.—Ijima, 1884c, 638.—Kitt, 1885a, 148.—Knoch, 1894a, 10.—Lamarck, 1816b, 189.—Lamouroux, 1822a, 297 (Amphistome).—Lang, 1892a, 81–89, 1 fig. (syn. Diplodiscus subc. Dies.) (Cerc. of); 1893a, 479.—Lejtenyi, 1881a, 5, 8, 10, 18, 20.—Leuck., 1863, 82, 488, 491; 1879, 107; 1886d, 80.—Levin., 1881a, 63, 69.—Looss, 1892b, 147–167, 1 fig., pls. 19–20 in text (devel-

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opment); 1894a, 8, 85, 117, 133, 136, 137, 142, 146, 150, 169, 178, 206, 227, 234, 237, 248; 1894d, 17, 21, 22; 1896b, 17, 31, 138, 171, 172, 178, 179, 180, 181, 182, 183, 188, 189, 190; 1901, 441; 1902m, 438, 444 (Cerc. diplocotylea).—Macé, 1882, 12.—Mont., 1888, 39, 49, 50, 73, 78; 1891, 117; 1893, 68, 160, 205.—Moul., 1856a, 18, 20 (eye of Cerc.), 47 (embryo, 125μ), 50, 125 (eye of Cerc.), 208–211, pl. 6, fig. 10 (Cerc.=Diplodiscus diesingii) (in Planorbis vortex), 212.—Mueller, ———.—Nitzsch, 1819, 398–399 (syn. Plan. subcl. Goeze).—Nord., 1840, 627 (syns. Plan. subcl., Fasciolaria ranæ Gmelin, Diplodiscus subcl. Dies.).—Olfers, 1816, 45, 48.—Pag., 1857, 25, 26, 49–50, 52, pl. 6, figs. 5–9 (in braunen Frosche).—Poir., 1885, 102.—Risso, 1826, 262.—Roosbach, 1906, 368, 369, 375, 392, 394, 402, 405, 408, 413, 414, 423, 429, 431.—Sieb., 1835, 56, 57, 67, 70; —, v. 1, 160.—Slawikowski, 1819, 49.—Sons., 1884, 59, 60, 61; 1893, 187 (subelavatum) 188 (in Rana temporaria), 189 (in Triton cristatus, Rana esculenta L.).—Ssinitzin, 1904, 768, figs. a, b; 1906, 684.—Stephens, 1906, 10.—Tennent, 1906, 650.—Villot, 1878, 6.—Wagener, 1857, 26, 27.—Walter, 1858, v. 1, in 268–297, pls. 11–13; 1866, 64–65.—Westrumb, 1823, 396.—Zed., 1803a, 198, pl. 3, fig. 3.

subclavatum Rud. of Staff., 1900, 405, 412 ("rectum of frogs, chiefly of the small grass frogs;" Canada); 1905, 689–690 (Rana virescens Kalm, R. catesbiana Shaw; Canada), renamed Diplodiscus temperatus.—Looss, 1885b, 24.

subelavatum Sons., 1893, 187, for subclavatum.

subtriquetrum Rud., 1814a, 100 (Castor fiber; Berlin, May); 1819a, 91–92, 360–361, 577, 589, 793.—Blainv., 1828, 583.—Bojanus, 1821, 164, pl. 2, figs. 5–12.—Braun, 1892a, 578, 601, 608, 680, 681, 694, 746; 1893a, 905.—Bremser, 1824c, pl. 8, figs. 32–33.—Civinini, 1842, ———.—Cobbold, 1879, 317.—Crep., 1837, 313, 323; 1841, 80.—Dies., 1836d, 238, 244, 245, 246, 248–249, pl. 23, figs. 7–9 (in Castor fiber) (syn. Dist. amphistomoides); 1850a, 402 (syn. Dist. amphistomoides).—Duj., 1845a, 331–332.—Eichwald, 1829a, 249.—Fischer, 1840, 157.—Fischder., 1901, 373; 1902a, 41, 42 to Cladorchis (Stichorchis); 1903h, 506, 507.—Kuech., 1855, 192.—Lamouroux, 1822a, 297.—Leidy, 1888, 126.—Leuck., 1863, 460.—Macé, 1882, 9.—Mol., 1859, 849 (in Castor fiber).—Nitzsch., 1819, 398, 399.—Nord., 1840, 547.—Olfers, 1816, 47.—Otto, 1896, 105–108, fig. 8.—Schmalz, 1831, 24, 27.—Sieb., 1835, 64, 65.—Slawikowski, 1819, 52.—Sons., 1895, 184, 187, fig. 7.—Westrumb, 1823, 397.—Also reported for Arvicola campestris, Fiber zibethicus.

subtriquetrum giganteum Kuech., 1855, 192.

sylviæ Rud., 1819a, 675 (Sylvia cyanea; Brazil), 793.—Dies., 1836, 253.—Westrumb, 1823, 398.

tadornæ Rud., 1819a, 89 (for A. anatis tadornæ and syn. of A. isostomum), 793.

tanagræ Rud., 1819a, 674–675 (Tanagra tatoa; Brazil), 793.—Dies., 1836, 253.—Duj., 1845a, 335.—Westrumb, 1823, 397.

tenuicolle Westrumb, 1823, 391–392, pl. 5, fig. 2 (Falco rufus).—Dies., 1850a, 316 (to Holost.); Mus. Cat. Vien.

truncatum Rud., 1819a, 91, 359–360 (in Phoca vitulina; Berlin and Vratislaviæ), 793.—Anacker, 1888b, 314; 1892c, 94.—Baillet, 1866b, 105 (syn. of Dist. conus).—Braun, 1892a, 578, 586; 1893a, 875, 905; 1893, 348, 349, 350; 1893d, 467 (in Phoca sp.); 1893f, 382, 383, 384, 385, 386, 389, 424, fig. 1; 1893g, 802 (syn. of Dist. conus Crep.).—Cobbold, 1875n, 819; 1879b, 307, 313.—Crep., 1839, 286.—Dav., 1877a, lxxx.—Dies., 1836, 238, 252, pl. 24, figs. 13–15; 1850a, 404; 1858c, 350 (syn. of Dist. conus), 358 (in Phoca grœnlandica).—Duj., 1845a, 331.—de Jong, 1896a, 3, 4, 5.—Lamouroux, 1822a, 297.—Linst., 1878, 44.—Mol., 1859, 849 (in Felis catus).—Mont., 1889, 321.—Verrill, 1870, 175, 220.—Ward, 1895, 341 (in Canis familiaris).—Westrumb, 1823, 397.—Zuern, 1882, 223.

truncatum of Dies., 1850a, 404 (in Felis catus); 1858c, 332 (syn. of Dist. lanceolatum).—Kitt, 1885a, 148 (in cat).—Sons., 1889, 281 (syn. of Dist. conus Crep.).—Stoss., 1892, 25 (syn. of Dist. conus Crep.).

trunkatum Schneidemuehl, 1896, 303, for truncatum.

tuberculatum Cobbold, 1875n, 819 (in ox; India); 1879b, 332.—Fischder., 1902a, 49 (in Bos taurus; India).—Stiles, 1898a, 67, 140.—Ward, 1895, 332 (in Bos taurus).

unciforme Rud., 1819a, 674 (Oriolus cristatus; Brazil), 793.—Braun, 1892a, 578; 1893a, 905.—Dies., 1836d, 238, 252–253, pl. 24, figs. 16–18; 1850a, 404.—Duj., 1845a, 335.—Westrumb, 1823, 397.

AMPHISTOMA—Continued.

unguiculatum Rud., 1819a, 91, 360 (Triton palustris; Berlin), 793.—Baird, 1853a, 44 (syn. of A. subclavatum).—Crep., 1839a, 286.—Dies., 1836d, 237, 254; 1850a, 319 (to Diplodiscus).—Fischder., 1903h, 487 (to Diplodiscus by Dies.).—Lamouroux, 1822a, 297.—Nitzsch, 1819, 399 (in Wassersalamander).—Westrumb, 1823, 397.

urnigerum Rud., 1819a, 89, 356–357 (in Rana esculenta; Mus. Vien.), 793.—Baird, 1853a, 49 (to Holost.).—Blainv., 1828a, 583.—Braun, 1892a, 796.—Bremser, 1824c, pl. 8, figs. 24–27.—Crep., 1825a, 41–45, 83.—Dies., 1850a, 318 (syn. of Codonocephalus mutabilis; type of Codonoc.).—Duj., 1845a, 378, 379 (to Holost.) (in Rana esculenta; Paris).—Lamouroux, 1822a, 297.—Moul., 1856a, 16 (type of Codonocephalus Dies., 1850).—Nitzsch, 1819, 400.—Sons., 1893, 190 (syn. of Cod. mut. Dies.).—Westrumb, 1823, 394.

vallei (Stoss., 1899) Looss, 1902m, [418], 430 (to Lophotaspis), 890; the reference on p. 890 (index) is apparently a lapsus for A. spinulosum.

variegatum Crep., 1825a, 38–39, figs. 4–6 (in Larus marinus; Greifswald); 1846, 139, 140, 146.—Dies., 1850a, 315 (to Holst.).—Duj., 1845a, 376.

watsoni Conyngham, 1904, Aug. 13, 464, Aug. 15, 252, Aug. 27, 355; 1904, Sept. 17, 663, figs. 1–2 (in Homo; Africa); 1904, Sept. 29, 1480; 1904, Oct. 8, 710; 1904, Sept. 8, 1092.—Shipley, 1905, 8 (syn. of Cladorchis watsoni); original patient in Zola (Nigeria) came from Adamawa, German West Africa.

AMPHISTOMÆ Mont., 1888a, 18.

AMPHISTOMATA Bojanus, 1817b, 275, 276.

AMPHISTOMATIDÆ Gamb., 1896a, 73.

AMPHISTOME Lamouroux, 1822a, 297, for Amphistoma.

AMPHISTOMEÆ Zuern, 1882, 113.—Brand., 1888, 49.—Braun, 1893a, 886.—Mont., 1888a, "mihi," 7, 11, 12, 14, 15, 16, 18, 34, 36, 38, 41, 51, 52, 56, 57, 60, 90, 91, 102, 103; 1892, Oct. 7, 195.

AMPHISTOMIDÆ E. Bl., 1847a, 309.—R. Bl., 1895, 730.—Brand., 1890a, 576.—Braun, 1893a, 886, 890, 895, 900, 904; 1895b, 136.—Cobbold, 1877, 235; 1879b, 4.—Cohn, 1904, 242.—Fischder., 1901, 367; 1902a, 8 (renamed Paramphistomidæ; 1903h, 489, 490 (syn. of Paramphistomidæ).—Kholodk., 1898, 25, 33.—Looss, 1899, 541, 542, 543.—MacCallum, 1905, 667.—Mont., 1888a, "mihi," 21, 90, 91, 103, 108; 1892, Oct. 7, 214 (f. of Malacocotylea); 1893, 82.—Much., 1898, 20.—Nickerson, 1902, 612.—Poir., 1883, 74; 1885, 147.—Schneidemuehl, 1896, 295.—Sons., 1895, 184, 185, 186.—Stiles, 1898a, 22, 24, 27, 64.—Stiles & Hass., 1898, 87.—Zuern, 1882, 113.

1895: Amfistomidi Sons., 1895.

[AMPHISTOMINA Lankester, E. R., 1890, 846 (f. of Gromiidea, Protozoa).]

AMPHISTOMINÆ Mont., 1892, Oct. 7, 214 (subf. of Amphistomidæ).—Braun, 1893a, 890.—Looss, 1899, 541, 543.—Not Amphistominæ, subf. of Gromidæ (Protozoa), see Calkins, 1901b, 106.

AMPHISTOMULUM Brand., 1892b, Oct. 7, 510 (proposed as an artificial collective group to contain immature amphistomes).—Stiles, 1902, 28, 48.

AMPHISTOMUM Nitzsch, 1819, 397.—Crep., 1825a, 35 (for Amphistoma, q. v.).

[AMPHITYPIE, a term, not a zoological name, see Looss, 1902m, 789–792.]

AMPHYSTOMA Rud., 1803a, 29 (for Amphistoma, q. v.)

ANADASMUS Looss, 1899b, 568–569 (m. amphiorchis) [not Anadasmus Walsingham, 1897, insect]; 1900d, 601, 602 (renamed Orchidasma); 1902m, 839.—Braun, 1901b, 20.—Luehe, 1901, 488.—Stiles, 1901, 185, 189, 191.

amphiorchis (Braun, 1899) Looss, [1899b, 568, 569]; 1902m, 463 (to Orchidasma).

ANAPORRHUTINÆ Looss, 1901, 205 (subf. of Fasciolidæ); 1901, 558; 1902, 479, 485, 844, 862–863 (diagnosis).—Odhn., 1902, 65, 68.—Pratt, 1902a, 888, 901 (key) (includes Anaporrhutum, Plesiorchorus; related genus Callodistomum).

ANAPORRHUTUM Ofenheim, 1900, 145–186 (type albidum Brand., designated by Looss, 1900b, 204).—Braun, 1902b, 23.—Darr, 1902, 652.—Looss, 1901b, 204, 205, 209; 1901l, 557, 558; 1902m, 479, 480, 481, 482, 484, 485, 526, 621, 813, 814, 844, 848, 851, 852, 853, 854, 855, 857 (Anaporrhutinæ), 858, 859, 860, fig. B. V, 863 (diagnosis).—Odhn., 1902, 65, 67.—Pratt, 1902a, 888, 900 (key), 901 (key).

ANAPORRHUTUM—Continued.

albidum Brand. in Ofenheim, 1900, 145–186, figs. 1–4 in text, pl. 3, figs. 1–8 (in body cavity and pericardium of Aëtobatis narinari, in Pacific).—Hollack, 1902a, 868.—Looss, 1901b, 204 (type of genus), 206, 209; 1901l, 557; 1902m, 479, 482, 483, 484, 620, 622, 623, 624, 625, 628, 791 (Amphitypie), 844, 848, 851, 852, 855, 857, 863.—Odhn., 1902, 154.

ricchiardii (Lopez, 1888) Looss, 1901b, 204, 206, 209; 1901l, 557, 558; 1902, 479, 482, 483, 484, 621, 622, 791 (Amphitypie), 844, 848, 852, 853, 854, 855 (to Probolitrema as type).

ricchiardii (Lopez of Ofenheim) Looss, 1902m, 479, 482, 483, 484, 621, 622, 852, 854, 855 (renamed Probolitrema capense).

richiardii of Ofenheim, 1900, 169–180, 178, 179, 180, 185, 186, pl. 3, figs. 9–12 (in Scyllium sp., Atlantic, near Kapstadt).—Odhn., 1901, 61; 1902, 61.

ANCHITREMA Looss, 1899b, 637 (m. sanguineum); ἄγχι, near related; 1901b, 200; 1902m, 839.—Klein, 1905, 78; 1905, 20.—Luehe, 1901, 487.—Odhn., 1902, 41.—Ofenheim, 1900, 183.—Pratt, 1902a, 889, 905 (key).

mutabile (Mol., 1859) Rizzo, 1902, 27–28, fig. 1 (Ascalobotes mauritanicus, Lacerta agilis).

sanguineum (Sons., 1894) Looss, 1899b, 637; 1902m, 492, 818, 823.—Heymann, 1905, 97.—Luehe, 1900aa, 565, 566.

ANCYROCEPHALUS Crep., 1839a, 292 (m. paradoxus),—Cerf. 1895h, 918; 1896, 514.—Dies., 1850a, 416; 1858e, 314, 368 (f. Polycotylea, subf. Aplacocotylea).—Mont., 1903, 336 (syn. of Tetraonchus).—Stiles & Hass., 1905b, 85.

paradoxus Crep., 1839a, 292 (in Perca lucioperca); 1846, 155.—Dies., 1850a, 416 (Greifswald, Vienna, Gedani); 1858e, 368, pl. 1 (in Lucioperca sandra).—Duj., 1845a, 654 (in P. luc.).—Kroyer, 1838–40a, 579 (in Lucioperca sandra).—Mont., 1888, 90; 1889, v. 3(2), 113–116 (syn. of Tetraonchus unguiculatus Wagener; in Lucioperca sandra, Perca fluviatilis); 1889, 26 Oct., 516–517; 1891, 109; 1893, 113–116.—Sieb., ———, 298.—Tasch., 1879, 238, 264 (syn. of of Tetraonchus unguiculatus Wagener).

ANCYROCOTILE Massa, 1903, 252, for Ancyrocotyle.

ANCYROCOTYLE Par. & Mont., 1903, v. 7 (1), 117–123, pl. 3, figs. 1–6 (m. vallei); 1904, May 17, 280.—Massa, 1903, 252 (Ancyrocotile); 1906, 44, 48.—Mont., 1903, 335 (subf. Ancyrocotylinæ; f. Tristomidæ).

vallei (Par. & Perugia, 1895) Par. & Mont., 1903, 117–121, pl. 3, figs. 1–6 (Naucrates ductor).

ANCYROCOTYLINÆ Mont., 1903, 335 (subf. of Tristomidæ).

ANGIODICTGUM Looss, 1902m, 648 (misprint for Angiodictyum).

ANGIODICTYIDÆ Looss, 1902m, 484, 617–684 (anat. histol.) 683 (diagnosis, key to genera), 699, 843 (contains Deuterobaris, Octangium, Microscaphidium, Angiodictyum, Polyangium).

ANGIODICTYUM Looss, 1902m, 433, 632, 634, 639, 641, 642, 645, 647, [648], 652, 657, 658, 659, 665, 666, 668, 675, 679, 681, 683, 684, 688–689 (diagnosis, m. parallelum [Looss]), 691, 698, 699.

1902: Angiodictgum Looss, 1902m, 648.

parallelum (Looss, 1901) Looss, 1902m, 632, 689–690, 696, 698, pl. 29, figs. 134–136, pl. 30, figs. 137–142.

ANISOCLADIUM Looss, 1902e, 637, new name for Anisogaster Looss, 1901, 658 (not Anisogaster Deyr, 1863, coleopteron), hence type fallax; 1902m, 789.

fallax (Rud., 1819) Looss, 1902m, 789.

ANISOCŒLIINÆ Looss, 1901c, 658.

ANISOCŒLINÆ Pratt, 1902a, 888, 894 (key), 899 (for Anisocœliinæ Looss) contains Anisocœlium and Anisogaster.

ANISOCŒLIUM Luehe, 1900, 504–507 (m. capitellatum).—Looss, 1901, 656, 658, 659; 1901, 206.—Odhn., 1905, 314.—Pratt, 1902a, 888, 895 (key), 899.

capitellatum (Rud., 1819) Luehe, 1900, 504–507, 508; 1901, 399.—Hollack, 1902a, 868.—Looss, 1901, 656–658, 659, 660, fig. 12; 1902, 789.—Stoss., 1901, 97 (in Uranoscopus scaber) (9).

ANISOCOTYLINÆ Mont., 1903, 336 (f. Monocotylidæ); 1904, 118; 1905, 70, 71; 1905, 117.

ANISOGASTER Looss, 1901e, 658 (tod. fallax Rud.) [not Anisogaster Deyr, 1863, coleopteron]; renamed Anisocladium Looss, 1902e, 637; 1902e, 789.—Pratt, 1902a, 888, 894 (key), 899.

fallax (Rud., 1819) Looss, 1901e, 658–660, 661, fig. 13.

gracilis Looss, 1901e, 660–661, fig. 14 (in Uranoscopus scaber; Triest).

"ANOICTOSTOMA Stoss." of Braun, 1899, 789, for Anoiktost. 1901b, 34; 1901f, 568; 1902b, 28, 30, 31.

planicolle (Rud., 1819) Braun, [1901f, 567;] 1902b, 28–31, fig. 20 (syns.: Dist. planicolle Rud., 1819; Duj., 1845; D. (Echinost.) planicolle Brand., 1892; Monost. echinostomum Dies., Mont.).

ANOIKTASTOMA Pratt, 1902a, 888, 894 (key), for Anoiktost.; related to Centrocestinæ.

ANOIKTOSTOMA Stoss., 1899, 11, 15–16 (coronatum=corvinæ=aloysiæ).—Looss, 1899b, 580, 581, 582, 583 (tld. coronatum=corvinæ=aloysiæ), 625.

1899: Anoictostoma Braun, 1899, 789.

1901: Anoitostoma Vaullegeard, 1901, 143.

1902: Anoiktastoma Pratt, 1902a, 888, 894 (key).

aloysiæ (Stoss., 1885) Stiles & Hass., 1908, 99.

cesticillus (Mol., 1858) Stoss., 1899, 15 (includes Dist. bicoronatum Stoss., 1883, 113, pl. 1, figs. 1–3) (in Corvina nigra, Umbrina cirrhosa, Lophius piscatorius, Zeus faber).—Looss, 1899b, 576 (type of Stephanost.).

colcostomum (Looss, 1896) Stoss., 1899, 15.—Looss, 1899b, 585 (type of Ascocotyle).

coronarium (Cobbold, 1861) Stoss., 1899, 16 (int. of Alligator missisipiensis).—Looss, 1899b, 578 (to Acanthost.); 1901 (to Acanthochasmus).

coronatum (Wagener, 1852) Stoss., 1899, 15 (including Dist. corvinæ and Dist. aloysiæ Stoss.) (int. of Corvina nigra); [name not available, see corvinæ] (type by designation of Looss, 1899b, 583).

corvinæ (Stoss., 1886) (type by designation, Looss, 1899b [581–583], [see aloysiæ 1885].

cuspidatum (Looss, 1896) Stoss., 1899, 15 (int. of Milvus parasiticus; Egypt).—Looss, 1899b, 584 (to Centrocestus as type).

fallax (Rud., 1819) Stoss., 1899, 16 (intest. of Uranoscopus scaber.—Type of Anisogaster, 1901; type of Anisocladium, 1902.

hystrix (Duj., 1845) Stoss., 1899, 15 (stomach of Lepidoleprus trachyrhynchus, Lophius piscatorius, Merlangus carbonarius, etc.).—Looss, 1899b, 576 (to Stephanost.).

imbutiforme (Mol., 1859) Stoss., 1899, 16 (intest. of Labrax lupus).

inflatum (Mol., 1859) Stoss., 1899, 16 (as doubtful) (intest. of Anguilla).

lydiæ (Stoss., 1896) Stoss., 1899, 15 (intest. of Orthagoriscus mola).—Looss, 1899b, 576 (to Stephanost.).

planicolle (Rud., 1819) Braun, [1901e, 567 (sub Anoictost.);] 1902b, 28, fig. 20 (includes Dist. planicolle Rud., 1819a, 687; Duj., 1845a, 430; Monost. echinostomum Dies., 1850a, 326; Mont., 1892, 30; Dist. (Echinost.) planicolle of Brand., 1892, 506).

pristis (Deslongchamps, 1824) Stoss., 1899, 15 (intest. of Gadus euxinus).—Looss, 1899b, 576 (to Stephanost.).

scabrum (Mueller, 1788) Stoss., 1899, 16 (intest. of Gadus morrhua, Merlangus pollachius, Lota molva).—Looss, 1899b, 582 to D. (Hemiurus).

sobrinum (Levin., 1881) Stoss., 1899, 15 (intest. of Cottus scorpius.)—Looss, 1899b, 576 (to Stephanost.).

spiniceps (Looss, 1896) Stoss., 1899, 15 (in intest. of Bagrus bayad).—Looss, 1899b, 578, 582 (to Acanthosomum as type).

ANOITOSTOMA Vaullegeard, 1901, 143 (misprint for Anoiktost.).

ANOPLODISCUS Sons., 1890, 172 (m. richiardii); 1891, v. 15, 147–148.—Braun, 1891d, 422; 1893a, 890.—Gamb., 1896a, 73.—St.-Remy, 1898, 522, 524.—Mont., 1892, Oct. 7, 213 (g. of Calceostominæ); 1903, 336 (subf. Anisocotylinæ); 1905, 65, 66, 68, 70.—Pratt, 1900a, 646 (key), 654.

richiardii Sons., 1890, v. 7, 16. Nov., 172 (t. h. Pagrus orphus); 1891, v. 15, 147–148.—Braun, 1891d, 422.—Mont., 1891, 108; 1905, 65–68, figs. 1–3 (host P. orphus).—Par., 1894, 138, 672, at Pisa.

ANTHOCOTILE Par. & Perugia, 1890, 11, 13, for Anthocotyle.

ANTHOCOTYLE Ben. & Hesse, 1863; 1864, 96, 104 (m. merluccii).—**Braun, 1890a,** 413, 415, 516, 517, 523, 534, 536, 546; 1893a, 890.—Cerf., 1895d, 476–478; 1895e, 510–527, 1 pl., figs. 1–9; 1895g, 536; 1895h, 913, 918, 920; 1896b, 422–423; 1896d, 497–510, 514, 515; 1899a, 345, 391.—Gamb., 1896a, 73.—Hoyle, 1890, 539 ("one species (A. merlucii) found in the hake").—Mont., 1888a, 11, 66, 86, 89, 99; 1892, Oct. 7, 213 (subf. of Octocotylinæ); 1903, 336, (subf. Diaphorocotylinæ).—Pratt, 1900a, 646, 653 (key), 656, fig. 37.—St.-Remy, 1898, 556.—Scott, 1901, 148.—Sons., 1895, v. 6 (6), 118–121; 1896, June 4, 790.—Tasch., 1879, 69; 1879, 238, 247.

merluccii Ben. & Hesse, 1863; 1864, 105, pl. 10, figs. 8–12 (in Merluccius vulgaris).—Cerf., 1895e, 510, 511–525, figs. 1–8; 1896, 497, 500, 510; 1896, 498–509.—Par. & Perugia, 1890, 7.—Pratt, 1900a, 656, fig. 37, 657.—Scott, 1901, 148, pl. 8, fig. 4 (in Merlucius merlucius; Aberdeen); 1905, 117.—Staff., 1904, 482 (gills of Merluccius bilinearis Mit.; Canada).

merlucii Tasch., 1879, 247 (for merluccii)—Braun, 1900a, 419, 453, 510, 536, 548, 551.—Hoyle, 1890, 539.—Mont., 1888, 7, 8.—Sons., 1895, 118, 119, 120.

(APOBLEMA) Duj., 1845a, 383, 389, 420, as subg. of Dist.; raised to generic rank by E. Bl., 1847, 302. See Apoblema and Hemiurus. Type appendiculatum.

affine (Rud., 1819) Stoss., 1886, 44.—See Derogenes.

apertum (Rud., 1819) Duj., 1845a, 422.

appendiculatum (Rud., 1802) Duj., 1845a, 420–421.—Braun, 1891d, 423. See Apoblema.

caudiporum (Rud., 1819) Duj., 1845a, 422. See Lecithochirium.

crenatum (Mol., 1859) Stoss., 1886, 58. See Apoblema.

excisum (Rud., 1819a) Stoss., 1886, 58. See Apoblema.

grandiporum (Rud., 1819a) Stoss., 1886, 63. See Apoblema.

labri rupestris (Olss., 1876) Stoss., 1886, 51.

mollissimum (Levin., 1881) Stoss., 1886, 58. See Apoblema.

ocreatum (Rud., 1802) Duj., 1845a, 422–423.—Type of Pronopyge, 1899. See Apoblema.

raynerianum (Nardo, 1827) Stoss., 1886, 58.

rufoviride (Rud., 1819a) Duj., 1845a, 421. See Apoblema.

tornatum (Rud., 1819a) Duj., 1845a, 421–422. See Apoblema.

ventricosum (Rud., 1819) Stoss., 1886, 59. See Apoblema.

APOBLEMA (Duj., 1845) E. Bl., 1847, 302–303 (appendiculatum.)—**Bettend., 1897a,** 17; 1897, 321.—R. Bl., 1891, 609.—Brand., 1891b, 267; 1891d, 19, 20.—Braun, 1891d, 423; 1892a, 570, 590, 603, 608, 641, 682, 710, 713, 715, 720, 721, 744; 1892h, 728, 729; 1893a, 838, 879, 885, 886, 890, 893, 894, 909, 911; 1895, 128, 138; 1899, 3; 1900h, 3.—Dies., 1850a, 331 (syn. of Dist.).—Hausmann, 1897b, 38.—Juel, 1889a, 46 pp., figs. 1–18 (anatomy); 1889b, 46 pp., figs. 1–18; 1890a, pp. 54–55.—Kath., 1894a, 130.—Looss, 1894a, 122, 129, 142, 170, 200, 201, 204, 224; 1894d, 42; 1896b, 122, 123, 125, 127, 134; 1899, 527, 535, 538, 542, 582, 637, 638, 729; 1902, 756, 839.—Luehe, 1900, 509; 1901, 394, 484.—Mont., 1888a, 92, 105; 1891d, 496, 522, 1 pl.; 1891e, 32 pp., 17 figs.; 1892, Oct. 7, 214 (gen. of Distominæ); 1891h, 742; 1893, 6, 27, 33, 34, 43, 53, 61, 84, 85, 86, 88, 90, 107, 123, 149, 151, 152, 153, 154, 182.—Nickerson, 1902, 609.—Ofenheim, 1900, 156, 179, 181.—Pratt, 1898, 352, 368, 375.—Stiles, 1901, 177, 178, 197.—Stiles & Hass., 1898a, 83, 90, 91 (syn. of Hemiurus).—Stoss., 1892, 4; 1898, 27. See Hemiurus.

1904: Apoplema Linst., 1904, 252, misprint.

appendiculatum (Rud., 1802) E. Bl., 1847, 302 303, pl. 12, fig. 3.—Barbagallo & Drago, 1903, 409 (in Lichia amia, Lophius piscatorius, Cantania; Scomber colias, S. scomber).—Braun, 1892a, 714.—Dies., 1850a, 371 (to Dist.).—Juel, 1889, 4, 5, 7, 8, 13, 19, 22, 23, 24, 25, 26, 27, 28, 30, 31, 32, 33, 34, 35, 36, 39, 41, fig. 17.—Lander, 1904a, 4, to (Hemiurus), 7, 14.—Looss, 1894a, 224; 1896, 123, 124, 125, 131–140, pl. 9, figs. 88–90 (in Alosa finta; Cairo).—Luehe, 1901, 396, 397, 399, 400.—Mont., 1891, 501, 502–508, 513, 516, 517, 518, 520, 521 (syns. D. app. Dies., 1858, D. ventricosum Wagener, 1860, D. ocreatum Olsson, 1868); 1891, 9; 1891, 502; 1891, 11, 12; 1893, 27, 61, 84, 95, 191, pl. 1, fig. 3.—Much., 1898, 21.—Odhn., 1905, 350, 351.—Par., 1902, 5 (in Clupea alosa, Scomber colias, S. scomber).—Pratt, 1898, 351–388, 3 pls. (anat., life history); 1900, 371.—Stoss., 1898, 28–29.—Also reported for Acipenser sturio, Trutta salar, Pseudocalanus elongatus.

APOBLEMA—Continued.

crenatum (Rud., 1802) Juel, 1889, 5, 7, 34.—Mont., 1893, 95.—Stoss., 1898, 27-28.

crenatum of Mol.—Juel, 1889, 5, 7, 34.—Mont., 1891, 520, 521, 522; 1893, 95.—Stoss., 1898, 27-28 (in Merlucius esculentus; Triest).

excissum Mont., 1891, 520 (for excisum).

excisum (Rud., 1819) Juel, 1889, 5, 7, 8, 9, 10, 12, 13, 14, 15, 16, 17, 18, 19, 20, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 38, 39, 40, 41, figs. 1-16.—Braun, 1892, 48; 1892a, 607, 609, 711, 713, 744; 1892h, 728, 729.—Lander, 1904a, 7, 21, 24.—Looss, 1894a, 173, 210, 216, 224; 1896b, 133.—Luehe, 1898, 624.—Mont., 1891, 503, 517, 520 (excissum), 521, 522; 1893, 6, 7, 95.—Pratt, 1898, 356.—Par., 1902, 5 (in Scomber colias, S. scomber), 375.—Stoss., 1898, 28.

grandiporum Mol. See Mont., 1891, 521.

grandiporum (Rud., 1819a) Juel, 1889, 6, 7, 23, 29, 34.—Looss, 1896b, 123; 1899, 641 (to Hemiurus).—Mont., 1891, 520.

labri rupestris (Olss., 1876) Mont., 1891, 518, 522.

microporum (Mont., 1889) Mont., 1891, 516, 521.

mollisimum Mont., 1893, 96 (for mollissimum).

mollissimum (Levin., 1881) Juel, 1889, 6-7, 29, 34.—Jacoby, 1900, 3.—Lander, 1904a, 14, 20 (to Hemiurus).—Looss., 1896b, 121-130, 136, pl. 9, figs. 85-87 (in Alosa finta); 1899b, 641 (to Hemiurus), 728 (H. bothryophorus) (in Alosa finta; Egypt).—Mont., 1891, 520 (mollissinum), 521 (mollissimun); 1893, 95, 102, 105.—Odhn., 1905, 359 (of Looss, 1896, as syn. of Lecithaster confusus).—Ofenheim, 1900, 179.—Staff., 1904, May 3, 484 (of Levin., as syn. of Lecithaster bothryophorus).—Stoss., 1898, 29-30.

mollissimun Mont., 1891, 521 (for mollissimum).

mollissinum Mont., 1891, 520 (for mollissimum).

ocreatum (Olss., 1868 nec Rud.) Mont., 1891, 520.

ocreatum (Rud., 1802a) Juel, 1889, 4-5, 7, 31, 33, 34, 40.—Braun, 1891d, 423; 1892a, 643.—Lander, 1904a, 1 (of Juel, syn. of Hemiurus crenatus (Rud.)).—Looss, 1899b, 639 (=Dist. carolinæ Stoss., type of Pronopyge, 1899).—Luehe, 1901, 399.—Mont., 1891, 15; 1891, 501, 508-512, 514, 516, 521, pl. 4, figs. 1, 5, 7, 10, 11, 14, 15c (syns. D. ventricosum Ben., D. carolinæ Stoss., 1889); 1893, 508; 1893, 61, 84, 95, 98, 99, 102, 191, pl. 1, fig. 16.—Pratt, 1898, 352.—Stoss., 1898, 29.

rufoviride (Rud., 1819) Juel, 1889, 6, 7, 8, 13, 19, 22, 23, 24, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 39, 41, fig. 18.—Barbagallo & Drago, 1903, 409 (in Anguilla vulgaris, Conger vulgaris; Catania).—Braun, 1892a, 711.—Jacoby, 1900, 3.—Lander, 1904a, 7.—Looss, 1894a, 224.—Mont., 1891, 520, 521; 1893, 53, 95, 191, pl. 1, fig. 5.—Par., 1902, 5 (in Anguilla vulgaris, Conger vulgaris, Nettastoma melanura, Rhombus lævis, Saurus griseus, Trigla cuculus).—Stoss., 1898, 29.

scabrum (Mueller, 1788) Juel, 1889, 5.—Mont., 1891, 520.

sluiteri (Brock, 1886) Braun, 1892, 48; 1892h, 729; 1893b, 179.—Looss, 1894a, 234 (to Eurycœlum, type).

stossichi Mont., 1893, 87 (for stossichii).

stossichii Mont., 1891, 501, 502, 512 516, 520, 521, pl. 4, figs. 2, 3, 4, 8, 9, 13, 15a, 16, 17 (syn. Dist. ocreatum Mont., v. 1, p. 87 (in Clupea aurita Cuv., C. pilchardus Wall.); 1891, 19 (D. ocreatum p. p.); 1893, 53, 61, 95, 96.—Barbagallo & Drago, 1903, 410 (stossichi) (in Alosa sardina; Catania).—Jacoby, 1900, 3.—Luehe, 1901, 399.—Ohdn., 1905, 351.—Stoss., 1898, 30.

tornatum (Rud., 1819) Juel, 1889, 6, 29, 31, 34, 40.—Looss, 1896, 125.—Mont., 1891, 516, 520, 521; 1893, 95.

ventricosum (Rud., 1819) Mont., 1893, 191.

[APOLEMA Hulst, see Zool. Rec., 1896, v. 33, Ins. 250.]

APOPLEMA Linst., 1904, 252 (for Apoblema).

APOROCOTYLE Odhn., 1900, 62-66 (m. simplex).

simplex Odhn., 1900, 62-66, 1 fig. (on gills of Pleuronectes flesus and especially Pl. limanda, the latter given as type host; Kristineberg, Sweden).—Mont., 1903, 335.

ASCOCŒLI Burm., 1837, 531.—Braun, 1890a, 515 (includes Gyrodactylus, Hirudinei).—Mont., 1888, 83.—Tasch., 1879, 233.

ASCOCOTYLE Looss, 1899b, Dec., 584–585, 586, 611 (tod. coleostoma); *ὁ ἀσκός*, Schlauch; *ἡ κοτύλη*, Napf; 1902m, 441, 824, 832, 833.—Braun, 1902b, 30.—Jægers., 1903a, 14.—Pratt, 1902a, 888, 894 (key).

coleostoma (Looss, 1896) Looss, 1899b, 582, 585, 699.

minuta Looss, 1899b, 585, 698–699 (in middle portion of small intest. of dogs and cats, in Cairo, Egypt, and in intest. of Ardea cinerea at Damietta; probably contracted from eating fish), 700, 701, fig. 23; 1901, 205.

ASPIDOBOTHRIA Mont., 1888, 91 (f. for Aspidogaster); 1892, Oct. 7, 195.—Braun, 1893b, 188.

ASPIDOBOTHRIDÆ Mont., 1888, 51 (Aspidobotridæ), 63, 67 (Aspidobothridæ), 71, 72, 90, 91 (Aspidobotridæ), 103, 107, 108; 1892, Oct. 7, 168 (revision), 195, 196, 197, 198 (diagnosis), 199 (key), 198–209, 213 (f. of Aspidocotylea); 1893, 36, 82, 114.—Braun, 1893a, 886, 888, 890, 891, 894, 895; 1893b, 188.—Gamb., 1896a, 73.—Kofoid, 1899, 179.—Nickerson, 1901, Mar. 8, 378; 1902, 597, 599, 606, 608, 612, 613, 614, 616.—Poche, 1907, 125.—Pratt, 1902a, 887, 891 (key; contains: Macraspis, Stichocotyle, Aspidocotylus, Platyaspis, Cotylaspis, Cotylogaster, Aspidogaster, Lophotaspis).—Stoss., 1898, 19 (Aspydobothridæ), 1899, 3, 4.

ASPIDOBOTHRII Burm., 1856a, 252.—Braun, 1890a, 516; 1893b, 188.—Mont., 1888, 84, 107.—Poche, 1907, 125.—Tasch., 1879, 233, 258.

ASPIDOBOTRIDÆ Mont., 1888, 52, 63, 91 (for Aspidobothridæ); 1892, Oct. 7, 213 (f. of Aspidocotylea).

ASPIDOCOTYLEA Mont., 1892, Oct. 7, 213 (suborder of Trematoda, for Aspidobothridæ).—Braun, 1893a, 890, 891, 894, 895, 917; 1893b, 188; 1895, 136.—Gamb., 1896, 73.—Kofoid, 1899, 179.—Looss, 1899, 543.—MacCallum, 1902, 636.—Odhn., 1902, 43, 44, 45.—Pratt, 1900a, 645, 646 (included in Digenea of Ben.), 647 (key); 1902a, 887, 891 (key).—Schneidemuehl, 1896, 295.—Ward, 1903, 864.

1896: Aspidokotylea Schneidemuehl, 1896, 295.

ASPIDOCOTYLE Dies., 1850a, 288, 413 (m. mutabile) for Aspidocotylus; 1858e, 314, 372.—Braun, 1890a, 546; 1893a, 887, 888, 890, 891, 892, 895, 904 (g. of Amphistomidæ), 907, 918; 1893b, 188.—Burm., 1856a, 251.—Hoyle, 1890, 539.—Kofoid, 1899, 181.—Looss, 1902, 428.—Mont., 1888a, 89, 91; 1892, 207; 1892, Oct. 7, 196, 197, 198, 213 (g. of Aspidobothridæ).—Nickerson, 1902, 612.—Pratt, 1900a, 647.—Tasch., 1879, 256, 259–260.

1892: Aspitocotyle Mont., 1892, Oct. 7, 197, misprint.

cochleariforme (Dies., 1838) Mont., 1892, Oct. 7, 207–208, fig. 6 (in Cichla temensis; Rio Negro, Brazil) (syn. mutabile).

mutabile (Dies., 1839) Dies., 1850a, 413 (int. of Cataphractus n. sp.; Rio Negro, Brazil) (includes A. cochleariformis as syn.).—Braun, 1893a, 907 (in Cichla temensis; Brazil).

mutabilis (Dies., 1839) Dies., 1858e, 372 (in Cichla temensis Humboldt).—Tasch., 1879, 256, 260 (syns. Aspidocotylus cochleariformis Dies., A. mutabilis Dies.) (in Cataphractus sp.; Rio Negro).

[ASPIDOCOTYLEEN Looss, 1902m, 418. German name.]

ASPIDOCOTYLUS Dies., 1838a, 189; 1839a, 234 (m. mutabilis); 1850a, 413, renamed Aspidocotyle.—Braun, 1892a, 568; 1893a, 879, 884.—Cobbold, 1877f, 326; 1877, 235, 237, 238; 1879b, 360.—Crep., 1841, 82.—Duj., 1845a, 479.—Lejtenyi, 1881a, 2.—Nord., 1840, 601.—Pratt, 1902a, 887, 891 (key).

1850: Aspidocotyle Dies., 1850a, 288, 413 (m. mutabile).

cochleariformis Dies., 1838a, 189 (in Cataphractus N. 150); 1839a, 234; 1850a, 413 (syn. of Aspidocotyle mutabile).—Cobbold, 1877, 237.—Mont., 1892, Oct. 7, 207 (to Aspidocotyle).—Tasch., 1879, 260 (syn. of Aspidocotyle mut.).

mutabilis Dies., 1839a, 234, pl. 15, figs. 20–22 (in Cataphractus; Rio Negro, Brazil) A. cochleariformis, renamed; 1850a, 413 (to Aspidocotyle); 1858e, 372.—Braun, 1892a, 580.—Cobbold, 1877, 237, 238; 1879b, 360.—Crep., 1841, 82.—Duj., 1845a, 479.—Mont., 1892, Oct. 7, 207 (syn. of Aspidocotyle cochleariforme).—Nord., 1840, 601 (in Cataphractus sp.; Amériq. méridion.).—Tasch., 1879, 260 (to Aspidocotyle).

sonsinoii (Cobbold, 1877) Cobbold, 1877e, 238, to Gastrodiscus.

ASPIDODASTER Mont., 1892, Oct. 7, 213, misprint for Aspidogaster.

ASPIDOGASTER Baer, 1826a, 124; 1827b, 525–557 (m. conchicola); 1828e, 671–678.—Ben., 1858a, 1861a, 11, 172, 345; 1882b, 14, 15, 16.—Bettend., 1897, 339.—Blainv., 1828, 584–585.—Blochmann & Bettend., 1895a, 216, 217.—Braun, 1890a, 480, 515, 516; 1890b, 127; 1892a, 568, 576, 586, 603, 614, 660, 671, 672, 673, 675, 688, 689, 704, 709, 711, 715, 716, 730, 731, 757, 758, 774, 775, 777, 779, 792, 843, 879, 884, 886, 887, 888, 889, 890, 891, 894, 896, 897, 917; 1893b, 177, 178, 179, 187, 188; 1894a, 1149; 1895, 26, 125.—Burm., 1837, 530; 1856a, 240, 252.—Carus, 1863, 478.—Cobbold, 1877, 238.—Crep., 1839, 285–286.—Dies., 1835c, 427; 1839a, 234; 1850a, 288, 414; 1858e, 314, 372–373; 1859c, 438.—Duj., 1845a, 324.—Eichwald, 1829a, 248.—Fraip., 1880c, 418, 443, 445.—Gamb., 1896, 63, 73.—Goldb., 1855a, 18.—Hoyle, 1890, 539.—Jackson, 1888, 642, 643, 646, 654.—Kofoid, 1899, 180, 181, 182, 183, 184.—Lander, 1904a, 5, 10.—Leuck., 1863, 489; 1879, 93, 119, 150, 151; 1886d, 70, 90, 117.—Looss, 1893b, 814; 1894a, 212; 1901, 625; 1902m, 428, 429, 430.—Mont., 1888, 12, 37, 38, 40, 43, 52, 56, 57, 63, 68, 71, 72 (Asptdogaster), 83, 84, 89, 91, 95, 103, 107; 1891, 121; 1892, Oct. 7, 170, 172, 175, 176, 180, 184, 185, 186, 187, 188, 189, 194, 195, 196, 197, 198, 199–205, 199 (syns.: Monost. Rud., 1819a, 87; Aspidonotus Keber, 1851; Cotylaspis Leidy, 1857, 18), 199 (diagnosis), 200 (key), 213 (g. of Aspidobothridæ); 1893, 36, 111.—Moul., 1856a, 235.—Nickerson, 1902, 599, 663, 604, 605, 609, 610, 612, 614, 617, 619.—Nord., 1840, 603 (1. conchicola; 2. limacoides).—Pag., 1857, 6.—Par., 1894, 140.—Poche, 1907, 125.—Poir., 1885, 102; 1886, 20, 21.—Pratt, 1902a, 887, 892 (key).—Raspail, 1829, v. 22, 556–564.—Shipley, 1904, in 77–106.—Staff., 1900, 405, 412; 1903, 824.—Stoss., 1899, v. 19, in 1–6, 1. pl.—Tasch., 1879, 233, 255, 258 (syns. Monost. Rud., Aspidonotus Keber).—Volz, 1899, 232.—Wagener, 1857, 25, 29.—Wallenstedt, 1847, 7.

1851: Aspidonotus Keber, 1851a, 19 (m. conchicola).

1888: Asptdogaster Mont., 1888, 72, misprint.

1892: Aspidodaster Mont., 1892, Oct. 7, 213, misprint.

ascidiæ Dies., 1858e, 373 (in Mentula marina, by Redi), sp. inq., based on Baer, 1827b, 549 (Redi's worm in Ascidia mentula).

cochleariformis (Dies., 1838) Cobbold, 1879b, 360 (syn. of Cotylegaster cochleariform.), lapsus, see Gastrodiscus sonsinoii.

conchicola Baer, 1826a, 124 (in Anodonta, Unio; Prussia); 1827b, 527–557, pl. 28; 1828, 671–678.—Aubert, 1855, 349–376, pls. 14–15 (anat., development).—Ben., 1858a, 1861a, 206, 210.—Bettend., 1897a, 25.—Blainv., 1828a, 584.—Blochmann & Bettend., 1895a, 216.—Braun, 1883a, 41; 1892a, 579, 592, 597, 598, 602, 631, 632, 637, 639, 640, 641, 642, 645, 655, 677, 678, 679, 687, 693, 699, 707, 712, 713, 715, 725, 731, 747, 749, 776, 780, 783, 790; 1893a, 841, 869, 870, 880, 883, 891, 897; 1893b, 183 (in Vivipara unicolor; Cleopatra bulimoides); 1893d, 468.—Burm., 1837, 530.—Crep., 1839, 286.—Dies., 1834a, 1231; 1835c, 423, 427; 1858e, 373 (in Unio purpureus, U. nasutus, U. radiatus, U. cariosus, U. pictorum, Anodonta marginata, A. anatina); 1859c, 438.—Duj., 1845a, 324–327.—Eichwald, 1829a, 248.—Fil., 1855b, 20; 1857c, 22, 27.—Fraip., 1880c, 418.—Gamb., 1896a, 63.—Gronkowski, 1902a, 515 (8) (conchicole).—Hoyle, 1890, 539, fig. 3f, 540 (description).—Jackson, 1888, 650.—Jægers., 1899, 203.—Kath., 1894a, 131.—Keber, 1851a, 19, 90.—Kofoid, 1899, 179, 180, 181, 182, 183, 184, 185.—Kuech., 1855, 184, 185; 1856c, 277.—Leidy, 1851b, 224; 1856b, 45; 1857a, 18; 1858a, 110 (Anodonta fluviatilis and A. lacustris; Phila.); 1877f, 260; 1904a, 53, 88, 108, 110, 111, 148.—Leuck., 1879, 149, figs. 48, 74; 1886d, 115, figs. 48, 74.—Looss, 1894a, 203; 1901, 624; 1902m, 420, 428.—Maclaren, 1904, 609.—Mont., 1888, 40, 43 (conchiola); 1891, 100, 103, 109, 121; 1892, Oct. 7, 172, 186, 188, 191, 195, 197, 198, 200–202, 203, fig. 2 (extensive bibliography); 1893, 111, 114.—Moul., 1856a, 13 (conchycola), 25, 144.—Much., 1898, 11.—Nickerson, 1902, 606, 614, 620 (in Unionidæ; Europe and N. America).—Nord., 1832a, 38; 1840, 603.—Odhn., 1902, 44, 45.—Pag., 1857, 35–36, pl. 4, figs. 1–5 (in Anodonta anatina).—Poir., 1886, 21.—Sieb., 1836, 217; 1836, 233; 1837, 263; 1838, 143, 144, 156.—Shipley & Hornell, 1904, 95, 98.—Staff., 1895, 22 July, 282–284; 1895, Oct., 536; 1896, 6 July, 477–542, pls. 36–39 (anat.); 1898, 698.—Steenstrup, 1842, 55.—Stoss., 1899, 3.—Tasch., 1879, 258–259 (syn. Aspidonotus conchicola Keber).—Voeltzkow, 1888, v. 8, 249–289, pls. 15–20.—Wagener, 1857, 25, 99, **pl. 16, figs. 1–3**; 1858, 383.

conchicole Gronkowski, 1902a, 515, for conchicola.

conchilega Braun, 1883a, 41, for conchicola.

conchiola Mont., 1888, 40, 43, for conchicola.

ASPIDOGASTER—Continued.

conchycola Dies., 1850a, 414 (for conchicola).

elegans (Olss., 1868) Mont., 1891, 122 (see 1888, 91); 1892, Oct. 7, 196.

insignis (Leidy, 1858) Braun, 1893a, 897.—Kofoid, 1899, 184.—Shipley & Hornell, 1904, 98.

lenoiri Poir., 1886, 20–22, pl. 1, figs. 1–3 (in Tetrathyra vaillantii; Sénégal).—Braun, 1892a, 580, 716; 1893a, 888, 891; 1893b, 188.—Kofoid, 1899, 181, 182, 184.—Mont., 1888, 42; 1891, 121, 122; 1892, Oct. 7, 198; 1893, 111.—Nickerson, 1902, 613.—Sons., 1896, 294.—Stoss., 1899, 4.

lenoirii Mont., 1888, 16, 38, 53, 54, 60, 71, 107 (for lenoiri).

limacoides Dies., 1834a, 1231; 1835c, 420–430, 1 pl., figs. 1–19 (in Cyprinus dobula, C. idus); 1850a, 414–415 (intest. of Leuciscus idus, L. dobula); 1858e, 373.—Braun, 1892a, 580; 1893a, 897.—Crep., 1839a, 286.—Duj., 1845a, 327.—Jackson, 1888, 650.—Kofoid, 1899, 184.—Kroyer, 1846–53a, 462 [671] (in Leuciscus idus).—Looss, 1902m, 420.—Mont., 1888, 71; 1891, 109, 121, 122; 1892, Oct. 7, 172, 195, 200, 202–203, fig. 3; 1893, 114.—Nickerson, 1902, 620 (in Leuciscus sp.; Europe).—Nord., 1840, 603.—Shipley & Hornell, 1904, 98.—Stoss., 1899, 3.—Tasch., 1879, 259 (in Leuciscus idus, L. dobula).—Voeltzkow, 1888, v. 8, 290–292.

macdonaldi Mont., 1891, 120; 1892, Oct. 7, 200, 203–204, fig. 4 [in Melo; Shark Bay, Australia].—Braun, 1893a, 870, 897; 1893d, 468.—Looss, 1901, 625; 1902m, 429, 430 (probably belongs to Lophotaspis).—Nickerson, 1902, 604, 620 (in Melo; Australia).—Shipley & Hornell, 1904, 98.—Stoss., 1899, 3.

macdonaldii Mont., 1891, 121, 122, for macdonaldi.

margaritiferæ Shipley & Hornell, 1904, 78, 90, 95–98, pl. 4, figs. 60–62, 66, 68, 69 (Margaritifera vulgaris; at Cheval Paar, Ceylon); 1905, 55.

ringens Lint., 1905, 327, 333, 367, 397, figs. 243–249 (in Micropogon undulatus, Trachinotus carolinus; Beaufort, N. C.).

sp. Braun, 1892a, 595.

vallei Stoss., 1899, 3–4, figs. 6–8 (in Thalassochelys caretta, at Corfù).—Looss, 1902m, 415, 418 (to Lophotaspis as type) (stomach of Thalassochelys corticata; Egyptian coast), 746.

ASPIDOGASTRIDÆ Poche, 1907, 125.

ASPIDOKOTYLEA Schneidemuehl, 1896, 295 (for Aspidocotylea).

ASPIDONOTUS Keber, 1851a, 19–20, 65, 66, 69, 90 (new name for Aspidogaster, hence type conchicola).—Braun, 1893a, 896.—Mont., 1892, Oct. 7, 199 (syn. of Aspidogaster).—Tasch., 1879, 258 (syn. of Aspidogaster Baer).

conchicola (Baer, 1826) Keber, 1851a, 19, 65, 66, 69, 90; 1854, 45.—Dies., 1858e, 373 (to Aspidogaster).—Mont., 1892, Oct. 7, 200, 201 (to Aspidogaster).—Tasch., 1879, 259 (to Aspidogaster).

ASPITOCOTYLE Mont., 1892, Oct. 7, 197 (for Aspidocotyle).

ASPTDOGASTER Mont., 1888, 72, misprint for Aspidogaster.

ASPYLOGASTER Mont., 1892, Oct. 7, 187 (for Cotylogaster).

ASTIA Looss, 1899b, 590–591, 592 (tod. renifera) [not Astia Koch, 1879, Arach.; Astea, Asteia, Asteja], ἄστειος, feingebildet; 1900, 602 (renamed Astiotrema).—Braun, 1901b, 37.—Pratt, 1903, 34.

impleta Looss, 1899b, 590, 703–705, fig. 26 (intestine of Tetrodon fahaka; in Nile, at Cairo, Egypt).—Braun, 1901b, 37.—Luehe, 1900, 561.

renifera (Looss, 1898) Looss, 1899b, 590.

ASTIOTREMA Looss, 1900, Dec. 3, 602, 607, Astia Looss, 1899 [not Koch, 1879, Arach.], renamed, hence type renifera; 1901, 560; 1902, 487, 505, 821.—Pratt, 1902a, 888, 899 (key).

crinacea (Poir., 1886) Stoss., 1904, 2 (in Delphinus delphis).

impleta (Looss, 1899) Stoss., 1904, 2 (in Tetrodon fahaka).

monticellii Stoss., 1904, 2–3, fig. 3 (in Tropidonotus viperinus; Naples).

renifera (Looss, 1898) Stoss., 1904, 2 (in Trionyx nilotica; Egypt).—Staff., 1905, Apr. 11, 693 (in Trionyx nilotica).

ASTOMUM Schlotthauber, 1860, 129 (n. poricola).

poricola Schlotthauber, 1860, 129 (in Anas boschas).

ASYMPHYLODERA Kowal., 1902d, 26 [8], misprint for Asymphylodora.

perlata (Nord., 1832) Kowal., 1902d, 26 (8).

ASYMPHYLODORA Looss, 1899b, Dec., 568–599 (tod. perlata); *ἀσύμφυλος*, unlike; *ἡ δορά*, skin; 1902, 760.—Luehe, 1900, 487; 1901, 488.—Ofenheim, 1900, 183.—Pratt, 1902a, 888, 902 (key) (related to Haplometrinæ).

1902: Asymphylodera Kowal., 1902d, 26, [8].

exspinosa (Hausmann, 1896) Looss, 1899b, 598, 599.

inaitans (Much., 1898) Looss, 1899b, 598.

perlata (Nord., 1832) Looss, 1899b, 598, 599.—Odhn., 1905, 322.

ATHESMIA Looss, 1899b, Dec., 635–637 (m. heterolecithodes) [not Athetmia 1816, lepidopteron]; *ἀθέσμιος*, gesetzlos.—Braun, 1901b, 34; 1901h, 702.—Pratt, 1902a, 889, 904 (key).—Stiles, 1901, 189.

heterolecithodes (Braun, 1899) Looss, 1899b, 635; 1902, 789.—Braun, 1901h, 702.—Engler, 1904, 186.—Hollack, 1902a, 867, 868.

AURIDISTOMUM Staff., 1905, Apr. 11, 690–691 (m. chelydræ); auris, ear.

chelydræ (Staff., 1900) Staff., 1905, 690 (in Chelydra serpentina; Canada).

AXIME Moul., 1856a, 10, misprint.—Cosmovici, 1887a, 127 (for Axine).

AXINE Abildg., 1794, 59–60 (m. belones) [not Oken, 1835, crustacean].—Ben., 1856c, in 643–654, 1 pl., figs. 1–21; 1858a, 1861a, 11, 52, 345.—Ben. & Hesse, 1864, 6, 96.—Braun, 1890a, 407, 414, 416, 420, 426, 437, 445, 448, 451, 453, 454, 458, 463, 468, 469, 483, 484, 485, 490, 492, 494, 498, 511, 515, 516, 517, 518, 523, 540, 541, 546; 1890b, 125; 1891d, 422.—Burm., 1837, 530; 1856a, 251.—Carus, 1863, 478.—Cerf., 1895h, 91; 1896, 514.—Cosmovici, 1887a, 127 (Axime).—Crep., 1839, 291.—Dies., 1850a, 290, 424, 425; 1858c, 315, 385–386.—Duj., 1845a, 317.—Gamb., 1896, 56, 73.—Goldb., 1855a, 19.—Goto, 1891a, 161, 169, 178, 183, 184; 1891c, 103; 1893a, 798.—Haswell, 1892a, 459; 1892b, 149; 1893c, 114.—Hoyle, 1890, 537, 539.—Ijima, 1884c, 638, 639.—Jackson, 1888, 642, 644, 645, 646, 647, 648, 654.—Juel, 1889, 33.—Kath., 1894a, 143, 152, 155.—Kerbert, 1881a, 573.—Kroyer, 1846–53a, 273; 1852–53a, 1221 (in Belone rostrata Fab.).—Looss, 1885b, 5, 10, 15, 17, 18; 1892, 72.—Lorenz, 1878a, in 405–436, pls. 31–33.—Mont., 1888, 11, 15, 34, 40, 52, 53, 59, 60, 61, 66, 83, 84, 86, 89, 101; 1893, 111; 1903, 336 (subf. Axininæ).—Moul., 1856a, 10 (Axime).—Par. & Perugia, 1890, 13.—Pratt, 1900a, 646, 653 (key), 657, fig. 40.—St.-Remy 1898, 562–563.—Stoss., 1898, 14.—Tasch., 1879, 40, 45, 56, 58, 61, 66, 69; 1879, 233, 255–256 (syn. Heteracanthus Dies.).—Wallenstedt, 1847, 7.—Ziegler, 1883, 557.

1856: Axime Moul., 1856a, 10.

aberrans Goto, 1894a, 198–199, pl. 7, figs. 5–6 (in Belone schismatorhynchus; Hagi, Japan).—St.-Remy, 1898, 563.

belones Abildg., 1794d, 59–60, pl. 6, fig. 3, a–b (in Belone acus).—Ben., 1856a; 1856c; 1857i; 1858a, 1861a, 52–54, 168, 169, 196 (in Esox belone); 1870, 80.—Blainv., 1828a, 568.—Braun, 1889k, 621; 1890a, 418, 424, 428, 436, 437, 443, 472, 477, 488, 494, 514, 541, 549, 550; 1891a, 52.—Crep., 1838b, 83–96 (syns. Heteracanthus pedatus, H. sagittatus); 1839a, 291; 1839, 163.—Dies., 1850a, 425 (syns. Heteracanthus pedatus, H. sagittatus); 1858c, 385–386; 1859c, 444.—Duj., 1845a, 317.—Goto, 1894a, 196.—Hoyle, 1890, 539, 540.—Juel, 1889, 36.—Kath., 1894a, 155.—Kroyer, 1846–53a, 273 (in Belone rostrata).—Lorenz, 1878, ——.—Mont., 1888, 8, 15; 1890, 422; 1893, 111.—Moquin-Tandon, 1846, 13, 395.—Nord., 1840, 598 (syn. of Heteracanthus pedatus Dies.) (in Esox belone).—Oken, —, 357, pl. 10.—Par., 1902, 3 (in Belone acus, Exocœtus volitans; Portoferrajo).—Par. & Perugia, 1890, 8.—Sieb., 1839, 163.—Stoss., 1890, 44; 1890, 52; 1898, 14.—Tasch., 1879, 35; 1879, 256 (syns. Axine orphii Ben. & Hesse, Heteracanthus pedatus, H. sagittatus Dies.) (in Belone acus).—Ziegler, 1883, 545.—Also reported for Belone vulgaris.

heterocerca Goto, 1894a, 197–198, pl. 7, figs. 1–4, pl. 8 (on Seriola quinqueradiata; Japan).—Pratt, 1900a, 657, fig. 40.—St.-Remy, 1898, 563.

orphii Ben. & Hesse, 1863, 116; 1864, 116–117, pl. 12, figs. 19–27 (in Esox belone).—Braun, 1890a, 418.—Tasch., 1879, 256 (syn. of A. belones).—Also reported for Belone vulgaris.

platyura Crep., 1838b, 83 (syns. A. belones, Heteracanthus pedatus, H. sagittatus).—Sieb., 1839, 163.

triangularis Goto, 1894a, 200–201, pl. 7, figs. 7–8 (on Acanthias schlegelii; Misaki, Japan).—St.-Remy, 1898, 563.

triglæ Ben. & Hesse, 1863, 117; 1864, 117 (Trigla hirundo).—Braun, 1890a, 418, 541, 549 (Brest), 552.—Tasch., 1879, 256 (in T. hirundo).

AXININÆ Mont., 1903, 336 (subf.; f. Microcotylidæ).

AZIGIA Staff., 1904, May 3, 488, misprint for Azygia.

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(BILHARZIA) written as subg. of Dist. by some authors, as Bomford, 1887a, but probably not intended as a subg. in all cases.

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nigrovenosum (Bellingham, 1844) Looss, 1902m, 822, as doubtful.

species Giard, 1897d, 956–957 (in Donax trunculus, Tellina fabula, T. tenuis, T. solidula, T. baltica).—Leger, 1879h, 957–958.

BRACHYLÆMUS E. Bl., 1847a, 295–302 (for Brachylaimus).—Dies., 1850a, 331.—Stiles & Hass., 1898a, 83, 84 (syn. of Brachylaima Duj., 1843).

cylindraceus (Zed., 1800) E. Bl., 1847a, 295–298, pl. 12, fig. 2.—Baird, 1853a, 51.—Dies., 1850a, 368 (to Dist.).—Looss, 1894a, 64 (to Dist.); 1899b, 600 (type of Haplometra).

erinacei E. Bl., 1847a, 300–302, pl. 9, fig. 2 (Erinaceus europæus; Paris).—Dies., 1850a, 335 (renamed Dist. linguæforme).

variegatus (Rud., 1819) E. Bl., 1847a, 298–300, pl. 13, fig. 1. Looss, 1894a, 71 (to Dist.). Type of Hæmatolœchus 1899 and Pneumonœces 1902.

BRACHYLAIMA Duj., 1843a, 338–341 (tld. advena).—Luehe, 1899k, 536.—Stiles & Hass., 1898a, 83–84, 96 (type advena = Dist. migrans 1845) (syns. Dist. (Brachylaimus) Duj., 1845, Brachylæmus Duj. of Bl.).

advena Duj., 1843a, 338–341 (in Sorex). Stiles & Hass., 1898a, 83, 84, 96 (designated type) (syn. Dist. migrans Duj., 1845).

fulvum Duj., 1843a, 340–341 (in musaraigne). Stiles & Hass., 1898a, 83 (in Sorex araneus).

(BRACHYLAIMUS) Duj., 1845a, 382, 388, 407–420 (Brachylaima, 1843, renamed, hence type advena), used as subg. of Dist. See also Brachylaimus.

æquale Duj., 1845a, 410.

aloysiæ (Stoss., 1885) Stoss., 1886, 58.

andersoni (Cobbold, 1876) Stoss., 1892, 19, 37.

annuligerum (Nord., 1832) Stoss., 1886, 44.

(BRACHYLAIMUS)—Continued.

arcuatum Duj., 1845a, 410–411.
aristotelis Stoss., 1892, 14–15, 40.
ascidioides (Ben., 1873) Stoss., 1892, 16, 40.
baraldii (Sons., 1892) Stoss., 1895, 218–219, 235.
bergense (Olss., 1868) Stoss., 1886, 63.
bothryophoron (Olss., 1868) Stoss., 1886, 57.
carnosum (Rud., 1819) Stoss., 1886, 59.
caudatum (Linst., 1873) Stoss., 1892, 39.
characis (Stoss., 1886) Stoss, 1886, 59.
cirratum (Rud., 1808) Duj., 1845a, 413.
conjunctum (Cobbold, 1860) Rail., 1893a, 365.
conostomum (Olss., 1876) Stoss., 1886, 62.
corrugatum Duj., 1845a, 409–410.
crassiusculum (Rud., 1809) Stoss., 1892, 151–152, 194.
cymbiforme (Rud., 1819) Stoss., 1895, 215–216, 236.
depressum Stoss., 1883; 1886, 59.
didelphidis Par., 1896, 3–5, fig. 1a (in Didelphis marsupialis azarae; Paraguay).
dimorphum (Dies., 1850) Stoss., 1886, 60.
elegans (Rud., 1802) Duj., 1845a, 414–415.
endemicum (Bælz, 1883) Stoss., 1892, 39, 40.
exasperatum (Rud., 1819) Duj., 1845a, 411.
fabenii (Mol., 1859) Stoss., 1886, 59.
fellis (Olss., 1868) Stoss., 1886, 57.
filum Duj., 1845a, 418.
flavescens (Ben., 1870) Stoss., 1886, 58 (in Gobius minutus).
globiporum (Rud., 1802) Duj., 1845a, 417.
globocaudatum (Crep., 1825) Duj., 1845a, 413–414.
instabile Duj., 1845a, 412.
leptostomum (Olss., 1876) Stoss., 1892, 17, 39.
lima (Rud., 1809) Stoss., 1892, 14, 39, 40.
linguatula (Rud., 1819) —— ? ——.
lorum Duj., 1845a, 407.
maculosum (Rud., 1802) Duj., 1845a, 412–413.
marginatum (Mol., 1858) Stoss., 1892, 149, 189.
megastomum (Rud., 1819) Stoss., 1886, 64.
mentulatum (Rud., 1819) Duj., 1845a, 415.
mesostomum (Rud., 1803) Stoss., 1892, 149–150, 193, 194.
micrococcum (Rud., 1819) Stoss., 1892, 150, 190.
migrans Duj., 1845a, 407–409=Brachylaima advena Duj., 1843, renamed.
moleculum (Linst., 1880) Stoss., 1892, 150, 192.
monas (Rud., 1819) Parona, 1896, 12–13 (in Siphonops annulatus; Brazil).
mormyri (Stoss., 1885) Stoss., 1886, 59.
mülleri (Levin., 1881) Stoss., 1886, 61.
oblongum (Cobbold, 1858) Stoss., 1892, 16–17, 37.
obovatum (Mol., 1859) Stoss., 1886, 59.
oligoon (Linst., 1887) Stoss., 1892, 149–192.
plesiostomum (Linst., 1883) Stoss., 1892, 152, 192.
pseudostomum (Will.-Suhm., 1870) Stoss., 1895, 219–236.
recurvum Duj., 1845a, 410.
reticulatum (Wright, 1879) Stoss., 1892, 154–155, 192.
robustum (Lorenz, 1881) Stoss., 1892, 18, 38.
rubens Duj., 1845a, 411.

(BRACHYLAIMUS)—Continued.

sanguineum (Sons., 1894) Stoss., 1895, 217, 235.

serpentatum (Mol., 1859) Par., 1896, 18–19 (in Sayris camperii=Scomberesox rondeletii: Padova).

signatum Duj., 1845a, 415–416.

soccus (Mol., 1858) Stoss., 1886, 64.

soleæ Duj., 1845a, 417–418.

subflavum (Sons., 1892) Stoss., 1895, 216, 235.

tenuicolle (Rud., 1819) Stoss., 1892, 18–19, 39.

tereticolle (Rud., 1802) Duj., 1845a, 419–420.

umbrinæ (Stoss., 1885) Stoss., 1886, 58.

validum (Linst., 1886) Stoss., 1892, 15–16.

varicum (Mueller, 1784) Stoss., 1886, 58.

variegatum (Rud., 1819) Duj., 1845a, 416–417.

vitellatum (Linst., 1875) Stoss., 1892, 154, 190.

vitta Duj., 1845a, 418.

BRACHYLAIMUS (Duj., 1845a) E. Bl., 1847a, 298 (Brachylaima renamed, hence type advena).—R. Bl., 1891, 609, 610.—Braun, 1892a, 643; 1893a, 885, 894, 909, 911; 1901b, 11; 1901e, 341, 342.—Giard & Billet, 1892, 614.—Johnston, 1902, 329.—Looss, 1899b, 535, 609.—Luehe, 1899, 530.—Mont., 1888, 92, 105; 1893, 43, 150.—Rail. & Marotel, 1898, 31, 38.—Sons., 1890, 141.—Stiles & Hass., 1898a, 84.—Stoss., 1892, 13; 1898, 32.—Volz, 1899, 231.—West, 1896, 323. See also (Brachylaimus).

BRACHYLEMUS Dies., 1850a, 331, for Brachylaimus, q. v.

variegatus (Rud., 1819) Dies., 1850a, 355 (to Dist.).—Molin, 1859, 828 (to Dist.).

BRACHYMETRA Stoss., 1904, 10 (m. parva) [not Mayr, 1865, insect].

parva Stoss., 1904, 10–12, fig. 1 (in Rana esculenta: Istria centrale).

BRACHYPHALLUS Odhn., 1905, 350, 356, 359 (tod. crenatus).—Nicoll, 1907, 84.

crenatus (Rud., 1802) Odhn., 1905, 349, 352–355, pl. 4, figs. 3–5 (includes Fasc. crenata Rud., 1802, 76, pl. 2, fig. 5; Dist. crenatum (Rud.) Rud., 1809a, 404, pl. 5, fig. 1; Mol., 1868, 48, pl. 5, figs. 96–98; Dist. appendiculatum p. p. Rud., 1819a, 404; Dist. tectum Linst., 1873, 104, pl. 5, fig. 4; Dist. ocreatum Mol. p. p. Lint., 1899, 288, pl. 35, figs. 16–24; Hemiurus crenatu (Rud.) Luehe, 1901, 24; Dist. crenatum Rud., 1810a, 376; Mol., 1859, 25, pl. 1, fig. 3); (hosts reported by Odhn. for Scandinavia: Cottus scorpius, Pleuronectes limanda, Gasterosteus aculeatus, Ammodytes tobianus, Salmo salar, S. trutta, Osmerus eperlanus); 1906, 62.—Nicoll, 1907, 72, 84, 88–89 (in Ammodytes tobianus).

BRANDESIA Stoss., 1899, 7, 10 (m. turgida).—Braun, 1900h, 6.—Looss, 1899b, 617, 623, 624–625.—Pratt, 1902a, 889, 903 (key), related to Brachycœliinæ —Staff., 1905, Apr. 11, 683, 684, 685, 686.—Stiles, 1901, 189, 190.

turgida (Brand., 1888) Stoss., 1899, 10.—Cohn, 1904, 235.—Kowal., 1902d, 27 [9].—Looss, 1899, 624, 775–777, figs. A. B.—Staff., 1905, Apr. 11, 684, 685.

BRAUNINA Heider, 1900a, 19–22, figs. a–d (Hemistomidæ); 1900b, 19–22, figs. 2–d.—Pratt, 1902a, 908 (key).—Wolf, 1903, 603–626, 1 pl., 11 figs.

cordiformis Wolf, 1903, 623, 1 pl., 11 figs. (in Squalus sp; Rio Janeiro).

BRAUNININÆ Wolf, 1903, 622, 623, n. subf.

BUCEPHALIDÆ Poche, 1907, 125.

(BUCEPHALOPSIS) Dies., 1855a, 396 (m. haimeanus) subg. of Bucephalus Baer.—Ziegler, 1883, 540.

aculeatus Dies., 1858, 275, based on Wagener's Furcocerce in Planorbis marginatus. Ziegler, 1883, 540.

haimeanus (Lacaze-Duthiers, 1854) Dies., 1855a, 396; 1858d, 275–276 (syns. Bucephalus (Bucephalopsis) haim. Lacaze-Duthiers; Cerc. haim. Moul.) (in Ostrea edulis, Cardium rusticum; Balearic Isles).—Tennent, 1906, 642.—Ziegler, 1883, 540.—See also sub Bucephalus.

BUCEPHALUS Baer, 1826a, 124–125 [not Smith, 1829, reptile] [m. polymorphus]; 1827b, 570–589 (m. polymorphus).—Biehringer, 1884, 20; 1888a, 231, 232; 235.—Brand., 1891d, 8.—Braun, 1892a, 589, 592, 599, 636, 640, 768, 769, 770, 771; 1893a, 823, 825, 834, 884, 892.—Burm., 1856a, 244, 245, 250.—Carus, 1835a, 94.—Cobbold, 1876, 304; 1879b, 453.—Dies., 1850a, 286, 294; 1855a, 395; 1858d, 271, 274.—Duj., 1845a, 478.—Erc., 1881e, 60; 1882a, 296.—Fil., 1854a, 6; 1857c, 22.—Garner, 1875a, 102 (in freshwater mussel).—Goldb., 1855a, 15.—Gronkowski, 1902a, 522 (15).—Hoyle, 1890, 539 (larva of Gasterost.), 540, fig. 4–F.—Jackson, 1888, 643, 651 (= Gasterost.; in Anodonta and oyster), 643, 654.—Kath., 1894a, 138.—Keber, 1852, ——.—Lacaze-Duthiers, 1854a, 294 ff.—Leuck., 1863; 454, 495, 503, 512.—Looss, 1885b, 6; 1892a, 125; 1894a, 55, 252.—Mont., 1888, 9, 77, 79, 80, 92, 94; 1893, 6, 9, 10.—Moul., 1856a, 65, 121, 124.—Odhn., 1905, 293, 304.—Pag., 1857, 7, 10, 29, 52, 53.—Poche, 1907, 125.—Spengel, 1905, 258.—Uličný, 1878, 214.—Woods, 1875, v. 4 (29), Aug., 58–66, pls. 4–5.—Ziegler, 1883, v. 39 (4), Dec. 31, in 537–571, pls. 32–33, figs. 1–28; 1883, v. 6 (148), 10 Sept., 487–492; 1905, 36.

1855: Eubucephalus Dies., 1855a, 395 (m. polymorphus).

aculeatus Dies., 1858, 275 (in Planorbis marginatus) to (Bucephalopsis).

[*bellii*, see Smith, reptile.]

crus Levin., 1881a, 80–81, pl. 3, fig. 7a–j (in Modiolaria discors; Egedesminde).—Braun, 1893a, 834.—Odhn., 1905, 304.—Tennent, 1906, 641, 643 (in Modiolaria discors).

cucullus Ziegler, 1883, 540 (for cuculus).

cuculus McCrady, 1874, Dec. 3, 176–192, figs. 2, 1–8 (in Ostrea virginiana; Charleston, S. C.)—Braun, 1893a, 834.—Tennent, 1906, 641, 644–646, 682 (syn. of B. haimeanus Lacaze-Duthiers) (in oyster; Charleston, S. C.).—Ziegler, 1883, 540 (cucullus).

cuculus McCrady, 1874, descr. of fig., misprint.

[*gutturalis*, see Smith, reptile.]

haimeanus Lacaze-Duthiers, 1854a, 294–302, pl. 6, figs. 1–10 (in Ostrea edulis, Cardium rusticum; Balearic Isles, Mahon, Cette).—Babcock, 1875a, 144, 145, 146, pl. 98, figs. 6–7.—Braun, 1893a, 834.—Caullery & Chappellier, 1906, 325.—Claparède, 1863, 10, 11 (to Cerc.).—Dies., 1855a, 379, 396, type of B. (Bucephalopsis); 1858d, 276 to (Bucephalopsis).—Erc., 1881e, 41, 87 (haimejanus); 1882a, 277, 323 (haimejanus).—Fil., 1855b, 21.—Giard, 1874e, 485–487 (encystation) (in Cardium rusticum, Ostrea edulis; Mediterranean); 1874f, 375–377; 1874g, 276–278; 1875a, 466–467; 1897, 955.—Huet, 1889a, 145–149; 1893a, 40–41.—McCrady, 1874, 176, 178, 179, 180.—Moore, 1875a, in 50–57, pl. 3.—Moul., 1856a, 86, 87, pl. 5, fig. 7, 178 (in Ostrea edulis, Cardium rusticum; Balearic Isles, Mahon, Cette).—Pag., 1857, 10; 1862, 295, 298 to (Bucephalopsis), 300, 301.—Tennent, 1906, Feb., v. 49 (4), 635–690, pls. 39, figs. 1–17, pl. 40, figs. 18–39, pl. 41, figs. 41–43, 51 (larva of Gasterost. gracilescens in oysters, Ostrea edulis, Cardium rusticum).—Uličný, 1878, 214, 215, 216.—Vaullegeard, 1894, v. 8, 8–14 (in Tapes decussatus, T. pullastra); 1894, 343.—Villot, 1875, 478.—Ziegler, 1883, 539, 540, 567.—Also reported for Belone vulgaris, Cardium edule, Mactra solida.

haimejanus Erc., 1881e, 87; 1882a, 323 (for haimeanus).

intermedius Uličný, 1878, 211–217, pl. 6, fig. 6 (in Anodonta cellensis).—Braun, 1893a, 834.—Tennent, 1906, 641, 643 (in Anodonta cellensis).—Ziegler, 1883, 541.

[*jardinii*, see Smith, reptile.]

polymorphus Baer, [1826a specific name not given]; 1827b, 570–589, pl. 30, figs. 1–27 (in Unio and Anodonta).—Badcock, 1875a, 141–146, pl. 98, figs. 1–5; 1875b, 149–150.—Ben., 1858a, 1861a, 220.—Bettend., 1897a, 13; 1897, 317.—Biehringer, 1884, 3; 1888a, 230.—Braun, 1883a, 54; 1893a, 834, 835, 838, 847.—Claparède, 1863, 10, 11.—Crep., 1839a, 293.—Desmonceaux, 1868, 22.—Dies., 1850a, 294; 1855a, 379, 395 (in Unio pictorum, An. anatina, A. cellensis); 1858d, 274–275 (syn. Cerc. polym.) (in U. pict., An. cell., A. anat.).—Duj., 1845a, 478.—Erc., 1881e, 37, 38, 41, 44, 45, 60, 87; 1882a, 273, 274, 277, 280, 281, 296, 323.—Fil., 1855b, 21, 22; 1857c, 27, 31.—Gamb., 1896a, 72.—Garner, 1838, 830.—Giard, 1874e, 485, 486.—Hahn & Lefevre, 1884, 806.—Hessling, 1852, 315.—Hoyle, 1890, 540, fig. 4–e.—Jacobson, 301, pl. 8, figs. 1–3.—Juel, 1889, 11.—Keber, 1851a, 99, 100; 1852a, 72.—Kuech., 1856c, 280.—

BUCEPHALUS—Continued.

Lacaze-Duthiers, 1854a, 297, 299, 300, 301.—Levin., 1881a, 80, 81.—Looss, 1885b, 19; 1892a, 122.—McCrady, 1874, 176, 178, 179.—Mont., 1888, 33, 77.—Moul., 1856a, 86, 145, 174, pl. 5 bis, fig. 6 (in An. anat., A. cell., U. pict.), see Cerc. polym.—Much., 1898, 11.—Nord., 1840, 548; 1840, 617, 630, 631.—Pag., 1857, 6, 8, 10, 27-28, pl. 3, figs. 2-8 (in An. anat.); 1862, 300, 302.—Poche, 1907, 124, 125.—Sieb., 1839, 165; 1854, 14.—Stewart, 1875, July, 1-2. pl. 107.—Tennent, 1906, 638, 641, 643, 646, 655, 660, 662, 663, 678, 682 (in An. mutabilis var. anatina and cellensis, U. pict.).—Uličný, 1878, 214, 215, 216.—Wagener, 1857, 22, 45; 1866, 145.—Ziegler, 1883, 488, 491; 1883, 537, 539, 540, 541-567, pl. 32, figs. 1-12, pl. 33, fig. 17, 23, 25 (in An. mutabilis var. cellensis).

[*typus*, see Smith, reptile.]

BUNODERA Rail., 1896, Mar. 15, 160, Crossodera Duj., 1845 [not Gould, 1837, bird] renamed, hence type nodulosa.—Braun, 1900, 232.—Hass., 1896a, 7.—Heymann, 1905, 83, 89.—Looss, 1899, 580, 594, 595, 597, 598, 599, 604, 671; 1902, 453, 454, 760.—Odhn., 1905, 296.—Pratt, 1902a, 888, 898 (key).—Staff., 1904, May 3, 491.—Stiles & Hass., 1898, 84-86, 96 (syns. Dist. (Crossodera) Duj., Crossodera Duj., 1860 [by Cobbold] [not Crossodera Gould, 1837, Aves]) (type Dist. nodulosum Zed., 1800=Fasc. luciopercæ Mueller, 1776).

auriculata (Wedl, 1857) Osborn, 1903, 63, 64, 67, 70.

cornuta Osborn, 1903, 63-73, figs. 1-7 (crawfish, black bass, rock bass, and catfish in Lake Chautauqua, N. Y.); 1905, Jan. 31, 22.

linearis (Rud., 1793) Rail., 1896, 160.

lintoni Pratt in Lint., 1901b, 435 (syn. Dist. auriculatum of Lint. in Acipenser rubicundus).—Cf. petalosum Lander.

nodulosa (Frœlich, 1791) [Rail., 1896, 160] Looss, 1899b, 598; 1901l, 564; 1902m, 452, 453.—Engler, 1904, 186.—Heymann, 1905, 83, 85.—Kowal., 1902d, 26 (8); 1904, 24 (9) (in Perca fluviatilis; Galicia).—Osborn, 1903, 63, 64, 67, 68, 70, 71, 72.—Staff., 1904, May 3, 489-490 (in P. flavescens Mit.; Canada).

BUNODERINÆ Looss, 1902, 453.—Pratt, 1902a, 888, 898 (key), contains Bunodera, Tergestia.

CÆCINCOLA Marshall & Gilbert, 1905, 477, 478-481 (m. parvulus).

parvulus Marshall & Gilbert, 1905, 478-481, pl. 15, figs. 1-4 (in Micropterus salmoides; near Madison, Wis.).

CALCEOSTOMA Ben., 1858a, 1861a, 11, 57, 59-60, 194, 196 (m. elegans).—Ben. & Hesse, 1864, 121.—Brand., 1894a, 305, 306.—Braun, 1890a, 411, 412, 416, 443, 451, 468, 472, 478, 483, 484, 492, 512, 514, 516, 517, 523, 542; 1893a, 890.—Dies., 1858c, 379 (syn. of Dactylogyrus calceostoma Wagener); 1859c, 441 (1 sp. elegans=calceostoma).—Gamb., 1896a, 73.—Hoyle, 1890, 539 (on Sciæna aquila).—Jackson, 1888, 642, 646, 648, 654.—Maclaren, 1904, 598, 599, 600.—Mont., 1888, 14, 52, 84, 86, 101, 107; 1891, 108; 1892, Oct. 7, 213 (g. of Calceostominæ); 1903, 336 (subf. Calceostominæ); 1905, 65, 66, 67, 68.—Par. & Perugia, 1890, 12; 1890, 8, sp.—Pratt, 1900a, 646, 654 (key), 657, fig. 49.—St.-Remy, 1898, 524, 564, sp.—Sons., 1890, 172; 1890, 174-176.—Tasch., 1879, 69; 1879, 265 (syn. Dactylogyrus Wag.).

1859: Calceostomum Dies., 1859c, 441, for Calceostoma.

elegans Ben., 1858a, 1861a, 60-63, 169, 170, 189, 190, 196, pl. 7, figs. 1-8 (in Sciæna aquila; Belgium).—Ben. & Hesse, 1864, 125-126.—Braun, 1890a, 417, 452, 543, 549, 552.—Dies., 1859c, 441.—Jackson, 1888, 646.—Mont., 1888, 8, 10.—Pratt, 1900a, 657, fig. 49.—St.-Remy, 1898, 564.—Sons., 1890, 174, 175-176 (in Sc. umbra); 1891, 263 (in Sc. um.).—Tasch., 1879, 265 (syn. Dactylogyrus calceostoma Ben.) (in Sci. aq.).

inerme Par. & Perugia, 1889, 747 (in Corvina nigra); 1890, 747 (in Corv. nig.); 1890, 8.—Parona, 1894, 139, Genova.—Braun, 1890a, 418, 543, 549, 550; 1891d, 422.—Sons., 1890, 174, 175-176 (in Corv. nigra, Umbrina cirrosa); 1891, 263 (in Um. cirrhosa).

CALCEOSTOMIDÆ Par. & Perugia, 1890, 19 [as subf.].—Mont., 1903, 336 [raised from subf. to f. rank] (subf. 1 Calceostominæ (g. Calceostoma, Fridericianella)).

CALCEOSTOMINÆ Mont., 1892, Oct. 7, 213 (subf. of Gyrodactylidæ); 1903, 336 (f. Calceostomidæ).—Braun, 1893a, 890.—Gamb., 1896, 73.

CALICOTYLE Dies., 1850a, 290, 431, 651 (m. kroyeri).—Braun, 1890a, 412, 415, 426, 435, 442, 447, 452, 454, 455, 468, 471, 472, 478, 483, 484, 491, 492, 511, 515, 516, 517, 523, 530, 531; 1893a, 890; 1896b, 7; 1899c, 80–82, 1 fig.—Cerf., 1894, 947; 1898b, 347, 352, 356, 362 (Calycotyle).—Goldb., 1855a, 20.—Goto, 1894a, 226–227; 1893a, 798.—Haswell, 1893e, 112.—Hoyle, 1890, 539.—Ijima, 1884c, 638.—Jackson, 1888, 646, 647, 650, 653.—Juel, 1889, 33.—Kerbert, 1881a, 572 (Callicotyle).—Looss, 1892a, 72.—Mont., 1888, 10, 11, 13, 37, 52, 57, 59, 65, 66, 84, 86, 88, 97, 98 (Callicotyle); 1888, 56, 57, 58, 60 (Callycotyle); 1891, 109, 127; 1903, 336 (subf. Calycotylinæ); 1905, 70.—St.-Remy, 1898, 523, 540.—Stoss., 1898, 9.—Tasch., 1878, 176 (Callicotyle); 1878, 573; 1879, 49, 50, 54, 57, 58, 60, 62, 64, 65, 66, 68; 1879, 236.

1850: Calycotyle Dies., 1850a, 650.

1858: Callicotyle Dies., 1858c, 313, 362.

1888: Callycotyle Mont., 1888, 56, 57, 58, 60.

1902: Calliocotyle Scott, 1902, 299–300.

1905: Callocotyle Scott, 1905, 117.

kroyeri Dies., 1850a, 431 (on Raja radiata; Kattegat).—Braun, 1890a, 410, 418, 420, 428, 434, 438, 449, 456, 461, 487, 512, 514, 531, 547, 551; 1899, 80, 81.—Cerf., 1894, 948.—Cunningham, 1887a, 278.—Goto, 1891a, 159, 184.—Ijima, 1884c, 638.—Juel, 1889, 14, 37.—Kath., 1894a, 152.—Kroyer, 1852–53a, 961 (kroyeri) (in Raja radiata Don.).—Looss, 1885b, 5, 18.—Mont., 1888, 7, 15, 53 (Callicotyle); 1891, 108, 111, 116, pl. 6, figs. 33–35.—Par. & Perugia, 1890, 6.—Pratt, 1900a, 656, fig. 20, 657.—Stoss., 1898, 9–10.—Tasch., 1878, 176 (Callicotyle); 1878, 573 (Callicotyle); 1879, 48, 49, 52, 55, 56, 61.—Wiergejski, 1877, 18 Oct., 550–561, pl. 31.—Ziegler, 1883, 545.

kröyeri Wierzejski, 1877, 550, pl. 31.—Hoyle, 1890, 539.

krœyeri Hœk, 1856a, 507–512; 1857a, 157–160, 1 fig.

mitsukurii Goto, 1894a, 227–229, pl. 19, t. h. Rhina sp.; Mitsugahama.—Braun, 1899, 80.—Cerf., 1898b, 341.

stossichi Braun, 1899, 80–82, 1 fig. (in Mustelus lævis; Berlin Aquarium).

CALICOTYLEA Dies., 1850a, 290, 431, subtribe of Monocotylea.—Goldb., 1855, 20.

CALICOTYLINÆ Mont., 1903; 1905, 70.

CALLICOTYLE Dies., 1858c, 313, 362 (see Calicotyle).—Ben. & Hesse, 1864, 66, 79.—Carus, 1863, 477.—Mont., 1893, 118.—Scott, 1902, 299–300.—Stoss., 1885, 162.

kroyeri (Dies., 1850) Dies., 1858c, 362 (on Raja radiata, R. batis).—Ben. & Hesse, 1864, 79.—Mont., 1888, 7, 15, 53.—Tasch., 1878, 176; 1878, 573.

kröyeri Wierzejski, 1877, 550–551.—Scott, 1902, 299–300, pl. 13, fig. 30 (on Raja clavata).

kroyerii Ben., 1870, 16.

CALLIOCOTYLE Scott, 1902, 299–300, for Calicotyle, q. v.

kröyeri (Wierzejski, 1877) Scott, 1902, 299–300, pl. 13, fig. 30 (in Raia radiata, R. clavata).

CALLOCOTYLE Scott, 1905, p. 117, for Calicotyle, q. v.

kröyeri (Wierzejski, 1877) Scott, 1905, 117.

CALLODISTOMUM Odhn., 1902, 154 (m. diaphanum).—Pratt, 1902a, 888, 900 (key), related to Anaporrhutinæ.

diaphanum Odhn., 1902, 154 (in Polypterus bichir; White Nile River).

CALYCODES Looss, 1901l, 565 (m. anthos); 1902m, 462 (καλυκώδης, knospenartig), 463, 839.—Pratt, 1902a, 888, 896 (key).

anthos (Braun, 1899) Looss, 1901l, 565–566; 1902m, 458–463, 869, pl. 21, figs. 17, 18 (includes Dist. anthos Braun, 1899, 720; 1901, 27, pl. 2, figs. 20–22, 24, 31).

CALYCOTYLE Dies., 1850a, 650, for Calicotyle, q. v.

kroyeri (Dies., 1850) St.-Remy, 1898, 540, 541 (in Rhombus maximus).

mitsukurii (Goto, 1894) St.-Remy, 1898, 540–541.—Cerf., 1898b, 341.

CALYCOTYLINÆ Mont., 1903, 336 (subf. of Monocotylidæ).

CAMPULA Cobbold, 1858b, 168; 1859d, 363 (m. oblonga).—Braun, 1893a, 885, 894; 1900g, 249–250, 254; 1901b, 34, 37, 38; 1902b, 5 pp..—Jackson, 1888, 648.—Looss, 1899, 558, 559, 560; 1901, 658; 1901, 208; 1902, 504, 708, 709, 715, 717, 718, 719, 730, 775–778.—Mont., 1888, 92; 1893, 153.—Odhn., 1905, 339, 344.—Pratt, 1902a, 887, 893 (key).—Stiles, 1901, 203, 204, 205.—Stiles & Hass., 1898, 85, 88, 97 ([error] syn. Opisthorchis R. Bl., 1895).

bilis (Braun, 1790) Rail., 1898, 412.

crassiuscula var. *janus* (Kowal., 1898) Rail., 1898, 412.

felinea (Rivolta, 1884) Kholodk., 1898, 354–355.—Type of Opisthorchis.

janus (Kowal., 1898) Rail., 1898, 412.

oblonga Cobbold, 1858b, 168, pl. 33, figs. 84–85 (in Delphinus phocæna) 1860a, 4; 1879, 419.—Braun, 1900g, 249–254, figs. 1–3; 1902b, 5.—Looss, 1899b, 558, 559, 560; 1902m, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 775, 776, 777, 778.—Mont., 1893, 44.—Stiles, 1901, 203, 204, 205.—Stiles & Hass., 1898, 85, 88, 97 (type of Campula).—Stoss., 1892, 16 (to Dist.).

palliata (Looss, 1885) Looss, 1901, 208.—Type of Brachycladium.

poturzycensis (Kowal., 1898) Rail., 1898, 412.

simulans poturzycensis (Kowal., 1898) Rail., 1898, 412.

CAPSALA Bosc, 1811, 384–385 (m. martinieri).—Ben., 1858a, 1861a, 11, 38.—Blainv., 1828, 568–569.—Braun, 1890a, 518.—Dies., 1850a, 428 (syn. of Trist. Cuv. and pp. syn. of Trochopus Dies.).—Johnston, 1865, 30, 33.—Encycl. méthodique, 1824, 164.—Massa, 1906, 51 (of Nord., syn. of Trochopus.)—Nitzsch, 1826, 150–151.—Nord., 1840, 602.—Tasch., 1878, 563, 566 (syn. of Trist.).

coccinea (Cuv., 1817) Blainv., 1828a, 569.—Baird, 1853a, 42.—Dies., 1850a, 429 (to Trist.).—Moquin-Tandon, 1846, 396.—Tasch., 1878, 567 (to Trist.).

elongata (Nitzsch, 1826) Nord., in Lam., 1840, 602 (syn. Nitzschia elegans Baer).—Baird, 1853a, 42 (includes: Hirudo sturionis, Phylline hippoglossi, Trist. elongatum, Nitzschia elegans).—Dies., 1850a, 426 (syn. of Nitzschia elegans).—Johnston, 1865, 33.

maculata (Rud., 1819) Nord. in Lam., 1840, 602.—Dies., 1850a, 430 (to Trist.).—Tasch., 1878, 567 (to Trist.).

martinieri Bosc, 1811, 384–385 (in Diodon sp. incerta).—Blainv., 1828a, 569.—Dies., 1850a, 430 (syn. of Trist. maculatum).—Moquin-Tandon, 1846, 396–397.—Nitzsch, 1826, 150.—Tasch., 1878, 567 (to Trist.).

papillosa (Dies., 1836) Nord. in Lamarck, 1840, 602 (in Xiphias gladius).—Dies., 1850a, 431 (to Trist.)—Stoss., 1898, 6.—Tasch., 1878, 567 (to Trist.).

rudolphiana (Dies., 1850a) Johnston, 1865, 33.

sanguinea Blainv., see Dies., 1850a, 429 (syn. of Trist. rudolphianum).—Nord., 1840, 602 (syn. Trist. coccineum Rud.) (in Xiphias).—Stoss., 1898, 5.—Tasch., 1878, 567 (syn. of Trist. molæ Blanch.).

tubipora (Dies., 1835) Nord. in Lamarck, 1840, 602.—Dies., 1850a, 428 (type of Trochopus; renamed T. longipes).—Massa, 1906, 53 (to Trochopus).—Mont., 1891, 123.—Stoss., 1898, 7.—Tasch., 1878, 568 (to Trist.).

CAPSALIDÆ Baird, 1853a, 41.—Johnston, 1865, 32, 299.

CATADISCUS Cohn, 1904, 243 (m. dolichocotyle).

dolichocotyle (Cohn, 1903) Cohn, 1904, 242–243.

CATATROPIS Odhn., 1905, 366, 367 (tod. verrucosa).

verrucosa (Frœlich, 1789) Odhn., 1905, 366–370, fig. 4, pl. 4, fig. 10 (includes Fasc. verrucosa Frœlich, 1789, 112, pl. 4, figs. 5–7; F. anseris Gmelin, 1790a, 3055; Monost. verrucosum Zed. of Levin., 1881, 78; ? e. p. Notocotyle verrucosum Frœlich of Mont., 1892, 40); in Somateria mollissima, S. spectabilis, Mergus serrator; west coast of Sweden and Arctic region; also in Anser domesticus, A. cinereus, A. leucopsis, Cygnus musicus, Bucephala clangula, from Pommern.

species from Spatula clypeata; Egypt.—Odhn., 1905, 369, see Looss, 1899b, 664.

CATILÆMASIA Looss, 1899b, Dec., 562–563 (tod. hians); κατά nach unten; ἡ αἰμασιά die Dornen.—Braun, 1901b, 33; 1901g, 896; 1902b, 4.—Pratt, 1902a, 887, 896 (key).—Stoss., 1901, 93 (5).

fodicans Braun, 1901g, 896–897 (in Sterna nigra; Vien. Mus.), 631; 1902b, 4, 5 (in S. nig.).

hians (Rud., 1809) Looss, 1899b, 563 (of Much.).—Braun, 1902b, 5.—Stoss., 1901, 93 (5).

CATOPTROIDES Odhn., in Looss, 1902m, 857 (Gorgoderinæ), 861, 862 (tod. spatula).

spatula (Odhn., 1902) Odhn. in Looss, 1902m, 857, 862.

spatulæforme (Odhn., 1902) Odhn. in Looss, 1902m, 857.

CENTROCESTINÆ Looss, 1899b, 586.—Jægers., 1903a, 14.—Pratt, 1902a, 888, 894 (key), contains Centrocestus, Ascocotyle; related genera, Acanthocasmus, Anoiktastoma.

CENTROCESTUS Looss, 1899b, Dec., 584, 586 (m. cuspidatus); *τὸ κέντρον*, spine; *ὁ κεστός*, Gürtel; 1902m, 832, 833.—Braun, 1902b, 30.—Jægers., 1903a, 14.—Pratt, 1902a, 888, 894 (key).

cuspidatus (Looss, 1896) Looss, 1899b, 582, 584.

CENTRODERMA Luehe, 1901, 59 (tod. spinossimum).

spinosissimum (Stoss., 1883) [Luehe, 1901d, 59].

CENTROVARIUM Staff., 1904, May 3, 493 (m. lobotes).

lobotes (MacCallum, 1895) Staff., 1904, May 3, 493 (in Esox lucius, Stizostedion vitreum).

CEPHALOBDELLIDEA Dies., 1850a, 291 (subtribe of Monocotylea to contain Astacobdella, Peltogaster, Pachybdella, Trachelobdella, Podobdella, Pontobdella, Ichthiobdella, Branchiobdella), 433, 650.—Goldb., 1855, 20.

CEPHALOGONIMINÆ Looss, 1899b, Dec., 628; 1900, 561.—Luehe, 1901, 487.488.—Pratt, 1902a, 889, 901 (key), includes Cephalogonimus, Emoleptalea, Prosthogonimus; related genus Stromylotrema.

CEPHALOGONIMUS Poir., 1886, 22 (m. lenoiri) *κεφαλή*, *γόνιμος*.—Braun, 1892a, 642, 645, 696, 704, 705, 713, 715, 733; 1893a, 885, 886, 890, 893, 909, 911; 1895, 138; 1900b, 3; 1902b, 68.—Looss, 1894a, 173, 174; 1899b, 536, 538, 541, 625, 626-627, 628, 721.—Luehe, 1899, 539; 1900, 555.—Moniez, 1896, 89.—Mont., 1888a, 15, 34, 92, 104; 1892, Oct. 7, 214 (gen. of Distominæ); 1893, 82, 95, 154, 157; 1896, 167.—Neumann, 1892, 345.—Pratt, 1902a, 889, 901 (key).—Stiles & Hass., 1898a, 85–86, 96.—Stoss., 1892, 4; 1898, 23.

americanus Staff., 1902, 5 Nov., 719–725, 1 pl., figs. 1–4 (in Rana virescens; Ashbridge's Bay, Toronto; May; also ? R. clamata); 1902, 30 Dec., 844; 1905, July, 52; 1905, Apr. 11, 687 (int. R. vir.; R. clamata).

lenoiri Poir. [1885, 3, pl. 2, figs. 1-2;], 1886, 22–24, pl. 2, figs. 1-3 (in Tetrathyra vaillantii Roch; Sénégal).—Braun, 1892a, 734; 1899b, 715; 1902b, 68.—Looss, 1899b, 626, 627; 1902m, 418 (in Trionyx nilotica), 783.—Luehe, 1899, 539.—Mont., 1893, 83, 102, 105, 106, 107, 157; 1896, 167 (lenori).—Stiles & Hass., 1898a, 85, 96.—Staff., 1902, 719, 725.—Stoss., 1895, 213.

lenori Mont., 1896, 167, for lenoiri.

ovatus (Rud., 1803) Stoss., 1892, 144; 1896, 126; 1898, 23; 1902, 13 (of 1896, 126, syn. of Cyclocœlum mutabile Zed.).—Hass., 1896a, 2 (syns. Fasc. ov. Rud., Dist. ov. (Rud.); D. bursicola Crep.) (in Gallus dom.).—Looss, 1899b, 629 (type of Prymnoprion), 720, 721.—Luehe, 1899, 539 (type of Prosthogonimus).—Mont., 1893, 157.—Rail., 1893a, 368.—Sons., 1890, 134.—Stiles & Hass., 1898a, 85.—Reported also for Accipiter nisus, Anser cinereus dom., Ardea cinerea, Bucephala clangula, Buteo vulgaris, Corvus cornix, Gallinago scolopacina, Harelda glacialis.

pellucidus (Linst., 1873) Rail., 1890, 138; 1893a, 369.—Braun, 1902b, 68.—Hass., 1896a, 2 (in Gallus dom.).—Looss, 1894a, 174.—Mont., 1893, 157.—Stiles & Hass., 1898a, 85.

CERATIUM Schrank, 1793.—Nitzsch, 1827, 69, contains Cerc. tripos [cf. Ceratium for Keratella Bory, 1824].

CERCARIA Mueller, 1773, 64–70 (contains gyrinus, catellus, podura, lupus, lemna, cyclidium, tenax, pleuronectes) [apparently lemna is type; cf. Braun, 1889a, 312, 315]; 1786.—Abildg., 1793, 88.—Aitken, 1866, 801, 806, 837; 1872, 144, 148, 204.—Assenova, 1899, 64–65.—Ben., 1882b, 14.—R. Bl., 1888a, 551, 557, 558, 559, 560, 561, 562, 604, 605, 610, 620, 627, 628, 647; 1890b, 2-3.—Bojanus, 1818a, 729–730 [688–689].—Bory de St. Vincent, 1823a, 354–355; 1823b, 355–356 (cercariées); 1824d, 189–191.—Bosc, 1802a, 223–224.—Braun, 1889a, 312 (only malleus and lemna of Mueller's original species of 1773 are true Cercaria); 315 (only inquieta and lemna of Mueller's, 1786, Cercaria are true Cercaria); 1890a, 515; 1892a, 767, 775; 1893a, 884; 1893b, 183 (of Dist. recurvatum Linst., in Physa alexandrina).—Bruguière, 1792, 456, 458.—Burm., 1837, 529; 1856a, 246, 250.—Cobbold, 1858a, 9 (structure); 1859d, 365 (in Cervus axis).—Dadai, 1888c, 107-109; 1888e, 105–106, pl. 3, fig. 16; 1888f, 84–86, pl. 3, figs.

CERCARIA—Continued.

11, 13 (Gulf of Naples); 1888g, 107–109, pl. 3, figs. 11, 13.—Dies., 1850a, 286, 293 (of Abildg., syn. of Cheilost.), 294 (of Nitzsch, syn. of Malleolus), 295–298, 299 (of Nitzsch, syn. of Histrionella); 1855a, 377–400 (revision); 1858d, 239–290, 245–246.—Duj., 1845a, 475–478; 1845b, 57–58.—Eichwald, 1829a, 247.—Fewkes, 1822a, 134–145 (with caudal setæ); 1882b, 192.—Gmelin, 1790a, 3891.—Goldb., 1855a, 16.—Herbst, 1787a, 19; 1789a, 129.—Hogg, 1870a, 232–235, pl. 50, figs. 1–3.—Jackson, 1888, 643, 651, 652, 653.—Johnston, 1865, 18.—Lereboullet, 1847a, 300 (migrations); 1847b, 266 (in insects).—Lespès, 1857b, 113–117, figs. 11–16 (of marine mollusks).—Leuck., 1863, 34, 73, 74, 493; 1879a, 41, 96; 1886d, 31, 72, 376.—Lint., 1905, 333, 401 (in Monacanthus hispidus).—Looss, 1892a, 124.—Mont., 1888, 4, 14, 24, 35, 37, 44, 45, 46, 74, 76, 79, 83, 94; 1892, 38.—Mueller, 1786, 119; 1850, 496.—Moul., 1856, 123.—Nitzsch, 1827, 66–69.—Nord., 1840, 617, 630–632.—Pag., 1857, 3, 4.—Parkes, 1891, 267.—Perroncito, 1879, 7–9 (in Rana esculenta); 1880, 454; 1884, 154; 1885, 208–209.—Piana, 1882, 12 pp. (of mollusks); 1882, v. 5.—Quintart, 1905, 724–725 of Barleeia rubra (Adams).—Schrank, 1803, 20.—Sieb., 1839, 153; 1850, 668.—Sons., 1884, 15 Dec., 57–61 (cellules à bâtonnets).—Steenstrup, 1842, 28.—Tasch., 1879, 233.—Vaney, 1901, 29 Apr., 1062–1064; 1901, 105 (in land mollusks).—Villot, 1875, 479 (in Conus mediterraneus).—Wagener, 1834, v. 27 (2), 131–132, pl. 1, fig. 4; 1857, 21.—Ward, 1903, 863, 864.—Wagner, 1883, 120.

1888: Cercavia Mont., 1888, 80, misprint.

I. Baer, 1827b, 621, pl. 31, figs. 1–4.—Dies., 1850a, 295 (syn. of Cerc. vesiculosa).

II. Baer, 1827b, 622, pl. 31.—Dies., 1850a, 296 (syn. of Cerc. chlorotica).

III. Baer, 1827b, 623, pl. 31, fig. 3.—Dies., 1850a, 296–297 (syn. of Cerc. brunnea); 1855a, 387.

V. Baer, 1827b, 625, pl. 31, figs. 5a, a.—Dies., 1850a, 299 (syn. of Histrionella ephemera).

VI. Baer, 1826a; 1827b, 627, pl. 31, figs. 6a, 6b.—Dies., 1850a, 295 (syn. of Malleolus furcatus).

VII. Baer, 1827b, 629, pl. 31, figs. 7a–b.—Dies., 1850a, 297 (syn. of Cerc. fallax); 1855a, 388.

acerca Biehringer, 1884a, 3 (in Onchidium carpenteri Stearns).—Braun, 1892a, 807 (in O. carp.).

aculeata Ere., 1881. See Par., 1894, 163 (in Lymnæa auricularia; Bologna).

affinis Eichwald, 1829a, 247–248, pl. 1, fig. 15a–c (in Lymnæus stagnalis).

agilis Fil., 1857c, 4–5, pl. 1, fig. 2 (in Lymnæus stagnalis: Turin).—Ben., 1858a, 1861a, 215, 216.—Dies., 1858d, 248–249 to (Gymnocephala).—Par., 1894, 162.

agilis Leidy, 1858a, 110 (free in Delaware River); 1904a, 111.

alata (Hemp. & Ehrenberg, 1828) Moul., 1856a, 213.

alba Ere., 1881e, 12 (for C. brunnea var. Dies.); 1882a, 248.

amphistomi subclavati Ben., 1858a, 82 (in Cyclas cornea, etc.).—Dies., 1859c, 435 (syn. of Diplodiscus subclavatus).—Ere., 1881e, 24, 35; 1882a, 260, 271.—Gerv. & Ben., 1859, 212.—Moul., 1856a, 20, 95, 106–107, 125, 208–211, pl. 6, fig. 10 (syns. Redia gracilis Fil., 1837, Diplodiscus diesingii Fil., Diplocotyle mutabile Dies.) (in Planorbis nitidus; Ticini; P. vortex; Moncalier).

arcuata Steenstrup.—Ere., ——.—See Par., 1894, 164 (in Lymnæa obscura, L. stagnalis; Bologna).

armata Sieb., 1837, 187 (based on Wagener, 1834, 131); [1835, 336;] 1850, 646, 669; 1854, 18, 21, 26, 27, 28.—Baillet, 1866b, 9, 92, 93, 94, 96.—Ben., 1858a, 1861a, 91, 92, 96, 168, 180, 220.—Biehringer, 1884, 2, 11, 14, 17, 24, 25.—Braun, 1892a, 598, 634, 636, 642, 701, 769, 771, 797, 806, 807, 809, 810, 814; 1893a, 820, 822, 829, 839, 848, 859, 963; 1900, 225.—Cobbold, 1879b, 454.—Desmonceaux, 1868, 21.—Dies., 1850a, 298 (includes Dist. tarda); 1855a, 377, 381, 388 to (Xiphidiocercaria) (in Lymnæus stagnalis, Planorbis corneus); 1858d, 251–252 to (Acanthocephala), larva of Dist. endolobum Duj. (in Plan. corn., Lymn. stag., Paludina impura), 259 (of Fil., 1855b, 305, pl. 1, figs. 2–4, syn. of C. (Acanthocephala) micracantha Dies.); 1859c, 434.—Dowker, 1882a, 9, 11.—Ere., 1881e, 13, 15, 18, 21–23, 48, pl. 1, figs. 32–37; 1882a, 249, 251, 254, 257–259, 284; 1881e, 19–21; 1882a, 255–257 (of Steenstrup).—Fil., 1854a, 6, 7, 8, 9, 10, 12, 22, 24; 1855b, 3–5, 7, 20, 21, 23, pl. 1, figs. 1–4 (in Lymn. pal.; Mon-

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calier); 1856a, 257; 1857c, 3, 16, 32.—Florance, 1866a, 4, 11.—Fraipont, 1880a, 397; 1880c, 417, 419, 441; 1881b, 4; 1883a, 35.—Hahn & Lefèvre, 1884a, 516.—Harz, 1881c, 4.—Hoyle, 1890, 538 (cf. Dist. signatum; D. muris).—Juel, 1889, 15.—Kath., 1894a, 136, 139.—Kerbert, 1881a, 556.—Knoch, 1862, 100, 103.—Leuck., 1863, 73, 504, 506, 508, 510, 511, 515, 522, figs. 146, 168, 175, 176, 177; 1879a, 96.—Linst., 1873, 1 (larva of Dist. endolobum Duj.); 1887, 98, 99, 100; 1887, 102 (syn. of Dist. ascidia Ben.).—Looss, 1885b, 19; 1892a, 128; 1894a, 90 (armatæ), 237, 252.—Macé, 1882, 61.—Mont., 1888, 26, 41, 45, 77, 78, 80; 1888, 196, 197.—Moul., 1856a, 77 (Lymn. stag., Plan. corn.), 78–79, pl. 5, figs. 2–4, 80, 102, 103, 116, 118, 146–152, pl. 5, bis fig. 10, 153, 154, 155, 156, 162, 163, 186, 217, 226, 227, 234 (in Pal. imp. Valette; Berlin; Lymn. stag., Plan. corn., Lymn. palustris; Moncalier).—Nord., 1840, 631.—Pag., 1857, 9, 18–19, 39 (in Lymn. stag.).—Par., 1894, 162.—Roewer, 1906, 217.—Rossbach, 1906, 363.—Schwarze, 1886, 63.—Sons., 1897, 253.—Steenstrup, 1842, 42–47, 51, 57, 78–94, pl. 3, figs. 1–6.—Stoss., 1892, 21.—Tennent, 1906, 661.—Valette St. George, 1855, 18, pl. 1, figs. P–Q.—Villot, 1882, 507.—Vogt, 1878, ——, fig. 33.—Wagener, 1834, 131, pl. 1, fig. 4; 1857, 22.

armata minor (Distomi retusi) Ben., 1858, 98, pl. 11, figs. 9–27 (in Lymnæus stagnalis; Belgium).—Dies., 1859c, 434 (syn. of Dist. retusum).

armatæ Looss, 1894a, 90, not as specific name, but as descriptive of several forms and used in the plural.

bilineata Haldemann, 1840a, 3 (in Limnea catascopium; Camden on Delaware).—Dies., 1850a, 300 (to Histrionella).

bipartita Sons., 1897, 253 (in Limnæa palustris; Pisa); 1897, 4.

brachysoma Villot, 1878, 27–28, pl. 9, figs. 1–3 (in Anthura gracilis Leach).—Mont., 1888, 94 (larva of Dist. brachysoma).

brachyura Fil., 1837a, 337, figs. 8–14 (in Planorbis submarginatus; Pavia), teste Par., 1894, 161 (in Plan. submarg.; Pavia), see next entry.

brachyura Dies., 1850a, 296 (Dist. polymorphum Fil., 1837a, 337, figs. 8–14, renamed) (in Planorbis submarginatus; Ticini); 1855a, 386 to (Eucercaria); 1858d, 257, to (Acanthocephala) (syns. C. (Eucerc.) br.; (in Plan. submarg.; Ticini; P. nitidus, P. vortex).—Moul., 1856a, 213 (syn. Dist. polymorphum Fil., 1837).

brachyura Lespés, 1857b, 117, pl. 1, fig. 15 (in Trochus cynereus).—Braun, 1893a, 831.—Dies., 1858d, 257 syn. of C. (Acanthocephala) pachycerca.—Pag., 1862, 297 (in Trochus cinereus).—Villot, 1875, 479 (in Trochus cinereus).

brevicaudata Piana, 1882 (in Helix carthusiana; Reggio Em.) teste Par., 1894, 161, 622.

brunnea Dies., 1850a, 296–297 (Cerc. III. Baer, 1827b, 623, pl. 31, renamed) (in Limnæus stagnalis; Regiomontii); 1855a, 387 to (Eucercaria); 1858d, 247, to (Gymnocephala), syn. C. (Eucerc.) br.; (in Lymn. stag.). -Baillet, 1866b, 96.—Ben., 1858a, 1861a, 89, 180 (syn. of Dist. echinata).- Erc., 1881c, 8-9, 11, 12, pl. 1, figs. 3-9; 1882a, 244–245, 247, 248 (in Paludina vivipara).—Linst., 1887, 104.—Moul., 1856a, 80-81, 118, 157-158 (in Lymn. stag.). -Par., 1894, 162 (in Pal. vivip.; Bologna, Erc.).

buccini mutabilis (Fil., 1855) Dies., 1858d, 266, to (Acanthocephala) (syn. Dist. bucc. mutab. Fil., 1855b) (in Buccinum (Nassa) mutabile; Genoa).—Mont., 1888, 75. Moul., 1856a, 85, 104, 168.

bucephalus Erc., 1881c, 40, 41–44, 60, 87, pl. 1, figs. 38–42; 1882a, 276, 277–280, 296, 323 (from Unio pictorum).—Braun, 1893a, 834, 839.—Tennent, 1906, 641, 643 (in Unio, Anodonta).—Ziegler, 1883, 541.

capriciosa Cuénot, 1892, in 1-23 (in Synapta inhærens) teste Braun, 1893a, 921 (syn.? Cerc. megacotyle Vill.); 1893b, 183.

capsularia Sons., 1892, 7. Oct., 144–146, pl. 18, figs. 6–7 (in Cleopatra bulimoides; Cairo, Egypt).—Braun, 1893b, 183.- Looss, 1896b, 223, 226, 227, pl. 16, figs. 183–190 (in Cl. bul. Jick.; near Alexandria).

caryophyllata Bory St. Vincent, 1823a, 354 (in Infusions de chènevis).

catellina Mueller, 1786, 130–131, pl. 20, figs. 12–13 (in Aqua fossarum, ubi Lemna).—Bosc, 1802a, 226–227.—Bruguière, 1792a, 456, 462–463.—Nitzsch, 1827, 68 to Dicranophorus.

CERCARIA—Continued.

catellus Mueller, 1773, 65–66 ("in aqua anno ferre in vasculo cum Hydrachnis servata ac in aqua flores per septimanam nutriente"); 1776, 206; 1786, 129–130, pl. 20, figs. 10–11.—Bosc, 1802a, v. 3, 226.—Bruguière, 1792a, 456, 462.—Gmelin, 1790a, 3892.—Herbst, 1789a, 129.—Nitzsch, 1827, 68 to Dicranophorus.

cellulosa sp. inq. Looss, 1896b, 227–229, 232, pl. 14, figs. 159–161 (in Melania tuberculata Bourg.; near Alexandria, Egypt).

cercopitheci Cobbold, 1861e, 119 (in Cercopithecus fuliginosus).

cervi Cobbold, 1861e, 119 (in Cervus axis).

chlorotica Dies., 1850a, 296 (Cerc. II. Baer, 1827b, renamed) (in Paludina vivipara; Regiomontii); 1855a, 386 to (Eucercaria); 1858d, 252–253 to (Acanthocephala) (syn. C. (Eucerc.) chlor. Dies.) (in Pal. vivip.).—Baer, 1827b, 622, pl. 31.—R. Bl., 1888a, 554.—Erc., 1881e, 7–8, 9, 11, 12, pl. 1, figs. 1–2 (in Pal. vivip., P. achatina); 1882a, 243–244, 245, 247, 248.—Fil., 1854a, 7.—Mont., 1888, 75.—Moul., 1856a, 80, pl. 5, fig. 7, 103 (syn. of C. microcotyla Fil.), 157, pl. 5, bis fig. 12 (syn. Cerc. II of Baer; in Pal. vivip.).—Par., 1894, 163.

clausi Mont., 1888, 79 (for clausii).

clausii Mont., 1888, 77, 79 (clausi); 1891, 110.—Braun, 1893a, 837, 854.—Giard, 1897c, 954, 955 (clausi).—Pintner, 1891, 285–294, 1 pl.; 1892, 619.

columbellæ Pag., 1862, 306, pl. 29, figs. 1–3 (in Columbella rustica).—Braun, 1889a, 362 (in Col. rust.); 1893a, 831.—Par., 1894, 163 (in Col. rust.; Spezia).

cometa Bory St. Vincent, 1823a, 354 (in Intusions d'orge).

coni mediterranei Fil., 1857c, 14.—Mont., 1893, 2.—Par., 1894, 163 (in Conus mediterraneus: Mediterranean).

conum Erc., see Par., 1894, 164 (in Bythinia tentaculata; Bologna).

cornuta Bosc, 1802a, v. 3, 224, pl. 32, fig. 2.

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exfoliata Moul., 1856a, 87, 116, 180–183, pl. 6, figs. 13, 14 [new name for Dist. of Leucochloridium paradoxum].—Cobbold, 1879b, 435.—Dies., 1858d, 277 (syn. of Leuc. par. Carus).—Erc., 1881e, 55 (Cerc. of Leuc. par.); 1882a, 291.—Zeller, 1874.

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fascicularis Villot, 1875, 480, pl. 14, fig. 4 (in Nassa reticulata; Roscoff).

fissicanda Moul., 1856a, 109 (for fissicauda).

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folii Looss, 1894a, 256 (syn. Dist. duplicatum).

forcipata Mueller 1786, 134–135, pl. 20, figs. 21–23 (in aqua palustri rarissime).—Bosc, 1802a, v. 3, 227.—Bruguière, 1792, 457, 464.—Nitzsch, 1827, 68 to Dicranophorus.

fulgopunctata Braun, 1893a, 831 (for fulvopunctata).

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furcata Nitzsch, [1817], 49, pl. 2, figs. 12–18; 1827, 68 (syn. Vibrio malleus Mueller).—Baer, 1827, 626–629.—Braun, 1893a, 821, 846.—Dies., 1850a, 295 (to Malleolus, only species, ?type by tautonymy malleus).—Fil., 1855b, 21, 22, 23; 1857c, 19, 23, pl. 2, fig. 31.—Moul., 1856a, 77, 84–85, pl. 5, fig. 13, 115, 116, 118, 120, 168, 169, 170, 171 (=Cerc. VI. of Baer) (in Lymnæus stagnalis; Paludina vivipara by Baer).—Nitzsch, 1827, 68 (syn. Vibrio malleus).—Nord., 1840, 631.—Pag., 1857, 4.—La Valette, 1855, 22, pl. 2, fig. J.

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globipora Erc., 1881 or 1882, see Par., 1894, 164 (in Bythinia tentaculata; Bologna).—Looss, 1894a, 47, 48.

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gorgoderæ loossi Ssinitzin, 1905, 44–46, pl. 1, figs. 3, 14 (syn. Cerc. macrocerca Wagener); 1906, 683 (in Epithecea; Warschau).

gorgoderæ pagenstecheri Ssinitzin, 1905, 46–47, pl. 1, figs. 4, 7, 13, pl. 2, figs. 15, 19, 20 (syn. C. macrocerca Thiry); 1906, 683.

gorgoderæ varsoviensis Ssinitzin, 1905, 47–49, pl. 1, fig. 5, pl. 2, figs. 16, 18; 1906, 683.

gorgoderæ vitelliloba Ssinitzin, 1905, 49–51 (syn. Cerc. macrocerca Fil., 26, pl. 10, fig. 7); 1906, 683.

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gracilis La Valette, 1855, 20–21, pl. 1, fig. 13 (in Planorbis corneus).—Ben., 1858a, 1861a, 220.—R. Bl., 1888a, 555.—Dies., 1858d, 264–265 (in Plan. corn.; Berlin) to (Schizocerca), 270.—Fil., 1857c, 23.—Moul., 1856a, 108–109, 116, 170–171 (in Plan. corn.; Berlin).—Wagener, 1866, 146.

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helicis viviparæ Dies., 1850a, 298 (for Dist. Bojanus, 1818, 730; Vilnæ); 1855a, 399.

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imbricata Looss, 1893a, 20 (in Bythinia tentaculata Gray=Paludina vivipara Lam.; near Leipzig); 1896b, 192–197 (sub Monost. verrucosum; in Melania tuberculata Bourg.); 1902m, 444 (sub Notocotyle verrucosa).—Sons., 1897, 252.

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inermes Looss, 1892a, 128, not as specific name, but meaning unarmed cercariæ.

inquieta Mueller, 1786, 121–122, pl. 18, figs. 3–7 (in aqua marina).—Baer, 1826a, 125.—Ben., 1858a, 1861a, 312.—Bory St. Vincent, 1825b, 253.—Bosc, 1802a, v. 3, 225.—Bruguière, 1792, 456, 458–459.—Dies., 1850a, 300 (to Histrionella).—Mueller, J., 1850, 496.—Moul., 1856a, 213 (of Nitzsch, 1817).—Nitzsch, 1817, 47; 1827, 67, 68.—Villot, 1875, 479.

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lacrhyma Bory St. Vincent, 1823a, 354 (in infusions d'orge et d'avoine).

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leptosoma Villot, 1878, 32–33, pl. 9, figs. 4–5 (=Cerc. stage of Dist. leptosomum Crep.) (in Scrobicularia tenuis).—Nicoll, 1906, 517, 518 [larva of Echinost. leptosomum] (in Scrob. ten.).

leucochloridii Leuck., 1858a, 114, see Leucochloridium paradoxum.

limacis (Dies., 1850) Moul., 1856, 83, pl. 5, fig. 11, pl. 8, fig. 12, pl. 9, figs. 8–9; 103, 163–164 pl. 8, figs. 19, 20, pl. 19, figs. 11–12; 165 (in Limax cinerea: Genève).—R. Bl., 1888a, 554.—Braun, 1893a, 831.—Dies., 1858d, 259 (syn. of C. (Acanthocephala) trigonocerca Dies.).—Erc., 1881e, 59; 1882a, 295.

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limnææ ovatæ Linst., 1884, 142; 1887d, 98, 99, 100 (in Limnophilus rhombicus), 105.—Stoss., 1889, 66 (syn. of Dist. endolobum).

limnææ truncatulæ Linst., 1892, 331–332, pl. 15, fig. 17 (in Limnæa truncatula).

linearis Lespès, 1857, 117, pl. 1, fig. 16 (in Littorina littorea).—Braun, 1893a. 381.—Dies., 1858d, 258 (in Litorina litorea) to (Acanthocephala).—Pag., 1862, 297 (in Litt. litt.).—Villot, 1875, 479.

longicaudata Piana, 1882, see Par., 1894, 161 (in Helix nemoralis, H. carthusiana; Reggio Em.) (see also longocaudata).—Dolley, 1894a.

longocaudata Piana, 1882, teste Par., 1894, 622 (misprint?) (in Helix carthusiana), as larva of Dist. lanceolatum.

lophocerca Fil., 1857c, 5, pl. 1, figs. 3–4 (in Paludina impura).—Braun, 1893a, 832.—Dies., 1858d, 245 (to Glenocerc.).—Erc., 1881e, 24, 25, 35; 1882a, 260, 261, 271.—Looss, 1894a, 252.—Par., 1894, 163 (in Bythinia tentaculata, Pal. vivipara, P. achatina; Torino by Fil., 1858).

luna Mueller, 1786, 139, pl. 20, figs. 8, 9 (in eadem aqua, ac proxime precedens, rarissime [C. orbis]; [Zool. Dan. prodr. addend., 1776, 280].—Bosc, 1802a, v. 3, 228.—Bruguière, 1792a, 457, 466.—Nitzsch, 1827, 69 to Lecane.

lungo-caudata Piana, see R. Bl., 1888a, 603 (in Helix carthusiana), see also longicaudata.

lupus Mueller, 1773, 67 (in aquosis, ubi Lemna vegetat, rara); 1776, 206; 1786, 131–133, pl. 20, figs. 14–17.—Bosc, 1802a, v. 3, 227.—Bruguière, 1792a, 456, 463.—Gmelin, 1790a, 3892.—Hemp. & Ehrenb., 1828a (type of Cycloglena).—Herbst, 1789a, 130.—Nitzsch, 1827, 68, to Dicranophorus.—Schrank, 1803, 83–84.

lutea (Ben., 1870) Giard, 1897c, 954–956 (to Brachycœlium luteum Ben.) (in Tapes decussatus, T. pullastra at Arcachon; Donax trunculus; Wimereux); 1897d, 957; 1903h, 27–28.—Caullery & Chappellier, 1906, 325.—Pelseneer, 1895, 357.—Also reported for Pholas candida.

lymnæi auricularis (Fil., 1854) Moul., 1856, 84, pl. 5, fig. 12; 167 (in Lymnæus auricularis by Fil.).—Dies., 1858d, 279 (to Cercariæum).—Looss, 1894a, 32, to (Dist.).

lymnæi obscuri Erc., 1881e, 33–35, pl. 1, figs. 16–17, 46; 1882a, 269–271, 282 (in (Limnæus obscurus, L. stagnalis).—Par., 1894, 162 (in Lymn. obs.; Bologna by Erc.).

macaci Cobbold, 1861, 119 (in Macacus radiatus).

macorcerca Looss, 1894a, 253 (misprint for macrocerca).

macrocerca Fil., 1854a, 13, 26, pl. 1, figs. 15–18 (in Cyclas cornea; Turin); 1855, 341, pl. 1, figs. 15–17; 1855b, 22, 24.—Baillet, 1866b, 93.—Biehringer, 1884, 2–3, 7, 9, 16, 17, 18, 22, 26.—Braun, 1883, 56; 1890c, 595; 1891c, 218; 1891f, 369; 1892a, 634, 808, 809, 810; 1892b, 188; 1893a, 831, 832, 854.—Claparède, 1863a, 12.—Cobbold, 1879b, 470.—Dies., 1855a, 389 to (Xiphidiocerc.); 1858d, 255, to (Acanthocephala) (syn. C. (Xiphidiocerc.) macr. Fil.) (larva of Dist. cygnoides Zed.) (in Cyclas cornea; Turin); 1858e, 334 to (Acanthocephala) (as syn. of Dist. cyg.)—Fraipont, 1880a, 397; 1880c, 419, 441; 1883a, 35.—Gamb., 1896, 72.—Hahn & Lefèvre, 1884a, 516.—Jackson, 1888, 651.—Juel, 1889, 15.—Kerbert, 1881a, 556.—Kowal., 1902d, 27 (9) [larva of Gorgodera cygnoides, in Cyclas cornea].—Leuck., 1863, 511, 512.—Linst., 1873, 1 (larva of Dist. cyg. Zed.).—Looss, 1885b, 19; 1892a, 125; 1894a, 23, 63, 129, 236, 244, 251, 253 (macorcerca), 256, 264, pl. 6, fig. 129; 1896b, 227; 1902m, 444 (sub Gorgodera cygnoides).—Mace, 1882, 61.—Mont., 1888, 41.—Moul., 1856, 82, 119, 160–161, pl. 6, figs. 1, 2; 173 (in Cyc. corn.; Turin).—Pag., 1862, 299.—Par., 1894, 165.—Pratt, 1898, 361.—Ssinitzin, 1905, 49 (of Fil., syn. of vitelliloba), 46 (of Thiry, syn. of pagenstecheri), 44 (of Wagener, syn. of loossi); 1906, 682.—Thiry (1859), v. 10 (2), 271–277, pls. 20–21, figs. 1–13; (1860), v. 10, 271–277, 2 pls.—Uličný, 1878, 212, 214.—Villot, 1882, 507.—Wagener, 1857, pl. 29.—Ziegler, 1883, 540, 547 (in Limnæa sp.).

magna Pag., 1857, 3, 4, 22–23, pl. 2, figs. 13–14 (in Paludina vivipara).—Dies., 1858d, 247, to (Gymnocephala) (in Pal. vivip.: Heidelberg).

major Nitzsch, 1817, 44, pl. 2, figs. 1–8; 1827, 68 (syn.? Brachionus proteus).—Dies., 1850a, 299 (syn. of Histrionella lemna).—Moul., 1856a, 213.—Mueller, 1850, 497.—Pag., 1857, 23.

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megacotyla Dies., 1858d, 263, to (Nephrocephala) (syn. Dist. echinatoides Pag., nec Fil.) (in Anodonta cygnea; Heidelberg).

megacotylea Villot, 1878, 30, pl. 9, fig. 7 (in Mysis).—Braun, 1893b, 183 (?syn. of C. capriciosa).—Cuénot, 1892.

melanoglena Pag., 1862, 298 [?Melanoglena bipunctata renamed].

micracantha Dies., 1858d, 259–260 (syn. C. armata Fil., 1855b, 3–5) to (Acanthocephala) (in Triton punctatus, Lymnæus palustris).—Linst., 1887, 100; 1878a, 205 (in Tr. tæniatus).

microcotyla Fil., 1854a, 7–12, 13, 26, pl. 1, figs. 5–10 (in Paludina vivipara, P. achatina; Lake Varese and Lombardy); 1854b, 260–265, pl. 10, figs. 5–10; 1855b, 6, 22, 23, 25 (syn. C. pugnax La Valette); 1856b, 85, 86; 1857c, 7, 15, 31.—Baillet, 1866b, 93.—Biehringer, 1884, 15.—Braun, 1892a, 809; 1893b, 183 (in Melania tuberculata; Cleopatra bulimoides).—Dies., 1855a, 378, 390 to (Xiphidiocerc.); 1858d, 253 to (Acanthocephala) (syn. C. (Xiphidiocerc.) micr. Fil.; C. pugnax La Valette) (in Pal. achat.; Lombardia; P. vivip.) (larva of Dist. tetracystis Gast.), 254 (syn. of C. (Acanthocephala)vesiculifera Dies.); 1858e, 348 (sub Acanthocephala as syn. of Dist. tetracystis).—Erc., 1881e, 7, 8, 9, 10, 11–15, pl. 1, figs. 10–15 (in Pal. vivip., P. achat.; liver and genital organs; Limnæus obscurus, Planorbis corneus), 71; 1882a, 243, 244, 245, 246, 247–251, 307.—Linst., 1873, 1 (larva of Dist. tetracystis Gast.).—Moul., 1856a, 80 (microtyla), pl. 5, figs. 5–6, 103, 104, 153–157, pl. 5, bis fig. 11; 160, 161 (syns. C. pugnax La Valette, C. chlorotica Dies., Cerc. II. Baer) (in Pal. vivip., P. achatina; Lac de Varèze and Berlin).—Sons., 1884, 58; ——, 136–137; 1897, 253.

microcristata Erc., 1881 or 1882, see Par., 1894, 161 (in Bythinia tentaculata; Bologna).

microtyla Moul., 1856a, 80 (for microcotyle).

microra Fil., 1857c, 5–6, pl. 1, figs. 5, 6 (in Paludina impura); 1859, ——.—Biehringer, 1884, 3, 26.—Braun, 1893a, 831.—Dies., 1858d, 258, to (Acanthocephala) (in Pal. imp.; Turin).—Looss, 1894a, 47 (= C. globipora=Dist. globiporum Rud.) (in Bythinia tentaculata); 1896b, 208.—Mont. 1888, 76.—Par. 1894, 163.—Ssinitzin, 1906, 685 (in Bythinia tentaculata), 686 (in Nephelis vulgaris but not Limnæa), larva of Sphærost globiporum.—Villot, 1878, 36.

minuta Erc. 1881 or 1882, see Par. 1894, 163 (in Bythinia tentaculata; Bologna).

minuta Nitzsch, 1817, 46, pl. 2, figs. 9–11 (in various mollusks at Halle); 1827, 68.—Dies., 1850a, 295; 1855a, 385 to (Eucerc.); 1858d, 246 to (Gymnocephala) (in various fresh-water mollusks at Halle).—Moul., 1856a, 213.—Spengel, 1905, 258.

miocerca Mont., 1888, 77 (for myocerca).

mirabilis Braun, 1891c, 218 (in Limnæus palustris var. corvus); 1891f, 369; 1892b, 187–188 (in Limn. pal. corv.; Kurischer Lowlands); 1893a, 821, 832, 834; 1893b, 183.

mongeotii Bory St. Vincent, 1823a, 354 (in water).

monostomi Linst. 1896i, in 376–377 (perhaps young of Monost. mutabile) (in Lymnæa ovata, L. peregra; Weende, Germany); 1897a, 109.

myocerca Villot, 1878, 35–36, pl. 10, figs. 12–13 (in Scrobicularia tenuis).—Braun, 1893a, 832.—Mont., 1888, 9, 77 (miocerca).

myzura Pag., 1881, 18 (in Neritina fluviatilis).—Braun, 1893a, 831.

neglecta Fil., 1854a, 24, 26, pl. 2, figs. 26, 27 (in Lymnæus pereger); 1854, 278, pl. 11, figs. 26–27; 1855b, 23.—Dies., 1855a, 386 to (Eucerc.), 387; 1858d, 246 to (Gymnocephala).—Moul., 1856, 94, pl. 5, bis. fig. 2; 116, 204, pl. 6, fig. 9 (in Lymn. per.).—Par. 1894, 165.

nodulosa Linst., 1873, 3, pl. 1, fig. 5 (in Bythinia tentaculata); 1873, 142, figs. 30–32; 1878a, 323 (=Dist. nodulosum).—Looss, 1894a, 40 (in By. ten. by Linst.) (=C. virgula Fil., and C. rostroaculeata) (not Dist. nodulosum).

obscura Sons., 1892, Oct. 7, 138 (in Limnæa natalensis; Cairo, Egypt); 1896, 321.—Braun, 1893b, 183 (in Limn. nat.).

ocellata La Valette, 1855, 22–23, pl. 2, fig. 5 (in Limnæus stagnalis).—Braun, 1893a, 821, 834.—Dies., 1858d, 270 (syn. of Histrionellina fissicauda).—Erc., 1881e, 35–36 (in Planorbis corneus, liver), 49, pl. 1, figs. 43, 44, pl. 2, fig. 18; 1882a, 271–272, 285.—Moul., 1856a, 109–110, 116, 118, 172–173 (in Lymn. stag.; Berlin).—Par. 1894, 161.—Sons., 1897, 253.

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odontocotyla Dies., 1858d, 264 (in Lymnæus stagnalis; Berlin).

opaca Bory St. Vincent, 1823a, 354 (in infusions de pois).

orbis Mueller, 1786, 138–139, pl. 20, fig. 7 (in aqua, ubi Lemna, rarissime); [Zool. dan. prod., 1776, 280].—Bosc, 1802a, v. 3, 228.—Bruguière, 1792a, 457, 466.—Nitzsch, 1827, 69 to Lecane.

ornata La Valette, 1855, 18–19, pl. 1, figs. N–O (in Planorbis corneus).—Braun, 1892a, 806; 1893a, 832.—Cobbold, 1876, 211; 1879, 454.—Desmonceaux, 1868, 22.—Dies., 1858d, 241, 244 to (Acanthocephala), 255–256 to (Acanth.) (larva of Dist. clavigerum Rud.) (in Plan. corn., Berlin; Hydrachna concharum; Heidelberg); 1858e, 388 to (Acanth.); 1859c, 434.—Fil., 1857c, 31, 32.—Florance, 1866a, 11.—Harz, 1881c, 4.—Leuck., 1863, 495, fig. 171.—Linst., 1873, 1 (larva of Dist. clavigerum Rud.).—Looss, 1894a, 90, 99, 237, 250, 252, 257.—Moul., 1856, 108, 120, 152–153 (in Plan. corn.; Berlin).—Pag., 1857, 13–18, 52, pl. 1, figs. 1–13 (in Plan. corn.); 1862, 301.—Rossbach, 1906, 389.

ovalis Schrank, 1803, 86.

ovata Villot, 1878, 29–30, pl. 9, fig. 6 (in Lygia oceanica).

pachycerca Dies., 1858d, 257–258, to (Acanthocephala) (syn. C. brachyura Lespès) (in Trochus cinereus; Francogalliæ).

pachycerca Claperède, 1863a, 12–13, pl. 18, fig. 1 (free form; St. Vaast).—Braun, 1893a, 831.—Par., 1894, 165 (in Cydippe sp.; Nizza; see Leuck., in Carus, 1884, Prod., 133).—Villot, 1878, 35 (of Dies. or Clap.?).

pacifica Ben., 1858a, 1861a, 86 (syn. of Dist. militare).

paludinæ impuræ Baer, 1827, 655, see Dies., 1855a, 400 (syn. of Cercariæum erythrops, and of C. melanops).—Moul., 1856, 96, pl. 5, bis fig. 4, 212–213, pl. 6, fig. 8; 216 (syn. Dist. paludinæ impuræ Fil.) (in Paludina impura; Lake de Varèse).

papillosa Erc., 1881 or 1882, see Par., 1894, 164 (in Bythinia tentaculata; Bologna).

parva Erc., 1881 or 1882.—Par., 1894, 164 (in Bythinia tentaculata; Bologna).

pectinata Huet, 1891a, 12, Apr., 162–165, figs. 1–4 (in Donax anatinum).

pelagica Mont., 1888, 45, 46.

pigmentata Sons., 1892, Oct. 7, 142–144 (in Physa alexandrina, P. micropleura; Cairo, Egypt) of an Amphist. (sp.).—Braun, 1893b, 183 (in Ph. micr.).—Looss, 1902m, 444 (sub Amphist. conicum).—Stiles, 1898a, 64, 65, 143.

planorbis carinati Dies., 1858d, 266, to (Acanthocephala) (in Planorbis carinatus; Turin).

planorbis cornei Dies., 1850a, 298 (in Planorbis corneus) (based on Henle, 1835, 597); 1855a, 400 (to Cercariæum).—Moul., 1856a, 85 (in Plan. corn.) (Henle, 1835, 597).

platyura Leidy, 1891a, 416 (free in pool with Lymnæus; Fort Bridger, Wyo.).

pleurolophocerca Sons., 1892, Oct. 7, 138–139 (in Melania tubercolata, Cleopatra bulimoides; Cairo, Egypt).—Braun, 1893b, 183 (in Mel. tub., Cl. bul.).—Looss, 1896b, 204–210, pl. 13, figs. 140–145 (in Mel. tub.; Egypt).

pleuronectes Mueller, 1773, 70 ("In aqua ultra sex septimanas in vasculo servata); 1776, 206; 1786, 135, pl. 19, figs. 19–21.—Bosc, 1802a, v. 3, 227.—Bruguière, 1792a, 457, 464.—Gmelin, 1790a, 3891.—Herbst, 1789a, 130.—Nitzsch, 1827, 69 to Phacus.—Schrank, 1803, 85–86.

podura Mueller, 1773, 66 ("In paludosis Lemna coopertis, Novembri et Decembri"); 1776, 206; 1786, 124–125, pl. 19, figs. 1–5.—Bory, St. Vincent, 1825a, 84 (to Furcocerca).—Bosc, 1802a, v. 3, 225.—Bruguière, 1792a, 456, 460.—Gmelin, 1790a, 3892.—Hemprich & Ehrenberg, 1828a, type of Ichthydium.—Herbst, 1789a, 130.—Nitzsch, 1827, 68 to Enchelys.

polymorpha (Baer, 1827) Moul., 1856, 86, 116, 174–177, pl. 6, fig. 11; 179.—Dies., 1858d, 275 (to Bucephalus).—Erc., 1881e, 41, 42, 43, 44–45, 60, 87; 1882a, 277, 278, 279, 280–281, 296, 323.—Par., 1894, 164 to (Bucephalus).—Ziegler,, 1883, 541.

pomatiæ Vaney & Conté, 1899, 194–196, figs. 1–2 (in Helix pomatia; Lyon).

prima Ssinitzin, 1905, 147–153; 1906, 687 (in Aplexa hypnorum, Planorbis vortex compressa; Warschau) (encysts in Corethra, Ilybius; Warschau).

proxima Lespès, 1857, 116, pl. 1, fig. 14 (in Littorina littorea).—Dies., 1858d, 249–250, to (Gymnocephala).—Pag., 1862, 297 (in Litt. litt.).—Villot, 1875, 479.

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pugio Linst., 1887, 105, pl. 2, figs. 7, 17c (in Limnæa ovata).

pugnax La Valette, 1855, 19, pl. 1, fig. R (in Paludina vivipara).—Dies., 1858d, 247.—Erc., 1881e, 11 (= C. microcotyla Fil.), 12; 1882a, 247, 248.—Fil., 1855b, 25 (syn. of C. microcotyla Fil.); 1857c, ——.—Moul., 1856, 103, 153, 157 (syn. of C. microcotyla).—Pag., 1857, 20–21, 22, pl. 1, figs. 17–24 (in Pal. vivip.).

punctum Erc., 1881 or 1882, see Par., 1894, 164 (in Bythinia tentaculata; Bologna).

pusilla Looss, 1896b, 229–230, 231, 232, pl. 16, figs. 178–180 (in Vivipara unicolor Olivier; Damanhour).

pyrula Bory St. Vincent, 1823a, 355 (in infusion de chènevis).

renale (Fil., 1855) Moul., 1856, 164–165 (in Helix aspera; Turin).—Dies., 1858d, 265–266 (renalis) to (Gymnocephala) (in H. adspersa; Turin).

rigonocerca Braun, 1892a, 809 (for trigonocerca).

rostrata Erc., 1881 or 1882, see Par., 1894, 164 (in Bythinia tentaculata; Bologna).—Looss, 1894a, 40.

rostroaculeata Erc., 1881, see Par., 1894, 164 (in Bythinia tentaculata; Bologna).—Looss, 1894a, 40 (see nodulosa).

sagitata Lespès, 1857, 114, pl. 1, fig. 12 (in Nassa reticulata; Arcachon).—Dies., 1858d, 249.

sagitta Pag., 1862, 297 (in Nassa reticulata), for sagitata.

sagittalis Vaney & Conte, 1899, 196 (C. sagittifera Sieb., 1854, renamed) (in Helix pomatia).

sagittata Dies., 1858d, 249, to (Gymnocephala) for sagitata (in Buccinum (Nassa) reticulatum), 250.—Villot, 1875, 479.

sagittifera Sieb., 1854, 18, fig. 3 (in Helix pomatia).—Dies., 1855a, 398 (syn. of Cercariæum helicis pomatiæ); 1858d, 278 (syn. of Cercariæum h. p.).—Moul., 1856, 82, pl. 5, fig. 10; 83, 163 (in H. pom.).

secunda Ssinitzin, 1905, 153; 1906, 687 (in Corethra, Ephemera larvæ; Warschau).

setifera O. F. Mueller, 1786, 127–128, pl. 19, figs. 14–16 (in aqua marina raro).—Bosc, 1802a, v. 3, 226.—Bruguière. 1792a, 456, 461.—Mont., 1888c, 193–199.—Nitzsch, 1827, 69 to Trichoda.

setifera Moul., 1856a, 214, and Dies., 1858d, 250–251 (Triest), to (Gymnocephala), based on J. Müeller, 1850, 497 (free in sea water; Marseilles).—Braun, 1893a, 832, 853.—Claparède, 1863a, 12, 13.—Dadai, 1888f, 85; 1888g, 108.—Giard, 1897c, 954, 955 (setigera).—Mont., 1888, 9, 10, 23, 77, 78, 79, 80 (Cercavia); 1888, v. 2, 193–199; 1891, 519; 1892, 717; 1893, 1, 2, 13, 47, 52, 55, 61, 70, 122, 124, 125, 209.—Moul., 1856a, 214.—Pag., 1862, 298.—Par., 1894, 165 (syn. Macrurochæta acalepharum).—Villot, 1875, 477, 479; 1878, 32, 33–35, pl. 10, figs. 1–8 (in Scrobicularia tenuis).

setigera Giard, 1897c, 955 (for setifera, 1856).

species Wagener, 1857, in liver of Limnæus stagnalis.—Braun, 1893a, 821 (is an Echinost.).

spermatica Blumenbach, see Chiaje, 1833, 34.

spinifera La Valette, 1855, 17, pl. 1, figs. 10–11 (in Paludina vivipara, Planorbis corneus).—Braun, 1893a, 832.—Dies., 1858d, 263–264, to (Nephrocephala) (in Plan. corn.; Berlin).—Erc., 1881e, 25, 26; 1882a, 261, 262.—Looss, 1894a, 252.—Moul., 1856, 109, 110, 202, 203 (in Plan. corn.; Berlin).

stylosa Linst., 1875, 193–195, pl. 3, figs. 16–17 (in Planorbis vortex); 1878a, 329 (in Plan. vor.).

subulo Pag., 1857, 19–20, pl. 1, figs. 14–16 (in Paludina vivipara).—Dies., 1858d, 256–257, to (Acanthocephala) (in Pal. vivip.; Heidelberg).

syrinus Küech., 1855, 471, misprint for gyrinus.

tellinæ balticæ Dies., 1850a, 298 (in Tellina baltica; Gedani), based on Sieb., 1837, 388; 1855a, 400 (to Cercariæum).—Moul., 1856, 85, 168 (in Tell. balt.).—Villot, 1875, 479 (in Tell. balt.).

tenax Müeller, 1773, 69–70 (in infusione sordium dentium intra quatriduum); 1776, 206; 1786, 136–137, pl. 20, fig. 1.—Bosc, 1802a, v. 3, 228.—Bruguière, 1792a, 457, 465.—Chiaje, 1833, 37–38.—Gmelin, 1790a, 3891.—Herbst, 1789a, 130.—Nitzsch, 1827, 69, to Phacus.—Olfers, 1816, 24.—Schrank, 1803, 84–85.

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terrestris Linst., 1889c, 241, pl. 16, fig. 14 (in Helix lens; Greece); 1889d.

terricola Linst., 1889c, 241, pl. 16, fig. 13 (in Helix vermiculata; Algiers); 1889d.

thaumanthiadis Braun, 1889a, 357 (in Eucope); 1893a, 832, for thaumantiatis.

thaumantiadis Pag., 1862, 298, for thaumantiatis.—Linst., 1887a, 334 (in Eucope sp.).

thaumantiatis Græffe, 1860a, 49–51, pl. 10, figs. 10–12 (in Thaumantias Græffe, cœlenterate, not Bonaparte, 1854, bird, compare Thaumantias Eschsch., 1829, Acal.).—Braun, 1889a, 357 (thaumanthiadis in Eucope); 1893a, 832 (thaumanthiadis).—Mont., 1888, 193, 194, 195; 1888, 77.

tricaudata Schrank, 1803, 86.

trigonocerca Dies., 1858d, 259, to (Acanthocephala) (syn. C. limacis Moul.) (in Limax cinereus, L. (Arion) rufus; Geneva).—Biehringer, 1884, 15.

triloba Fil., 1857c, 3, pl. 1, fig. 1 (in Planorbis carinatus, Lymnæus stagnalis; Turin).—Dies., 1858d, 252, to (Acanthocephala) (in Lym. stag., Plan. car.).—Erc., 1881e, 15–17, pl. 1, figs. 20–22; 1882a, 251–253 (in Lim. stag., Plan. car.; Po, in Piemonte).—Par., 1894, 161 (in Plan. corn., P. carinatus, Lym. stag.; Torino).

tripes Bosc, 1802a, v. 3, 227.

tripos Müeller, 1776, 206 ("in aqua marina"); 1786, 136, pl. 19, fig. 22.—Bruguière, 1792a, 457, 464–465.—Nitzsch, 1827, 69.

tripunctata Erc., 1881e, 23–25, pl. 1, figs. 27–28; 1882a, 259–261 (syn. C. ephemera Nitzsch) (in Planorbis corneus; liver and genital organs; Italy).—Mont., 1888, 10.—Par., 1894, 161 (in Plan. corn.; Bologna).

tripus Gmelin, 1790a, 3892, for tripos Müeller.

tuberculata Fil., 1857c, 8–9, pl. 2, figs. 19, 20 (in Paludina impura).—Braun, 1893a, 827.—Dies., 1858d, 248, to (Gymnocephala) (in Pal. imp.; Turin).—Harz, 1881c, 4.—Looss, 1894a, 138.—Par., 1894, 163.

turbo Müeller, 1786, 123–124, pl. 18, figs. 13–16 (in aqua rivulari cum Lemna rarior).—Abildg., 1793, 79.—Bosc, 1802a, v. 3, 225.—Bruguière, 1792a, 456, 459–460.—Nitzsch, 1827, 68, type of Urocentrum.

varicans Abildg., 1794, 89, pl. 3a, figs. 1–4 ("Hab. primitivum ignotum, in aqua rivulari").—Dies., 1850a, 293 (to Cheilostomum as type).—Moul., 1856a, 213 (syn. Ch. varicans Dies.).—Pag., 1857, 6.

varsoviensis Ssinitzin, 1906, 683, to (Gorgodera).

vermicularis Müeller, 1786, 133–134, pl. 20, figs. 18–20 (in aqua ubi Lemna vegetat).—Bosc, 1802a, v. 3, 227.—Bruguière, 1792a, 457, 463–464.—Nitzsch, 1827, 68, to Dicranophorus.

vesicata Uličný, 1878, 211–217, pl. 6, figs. 1–5 (in Cyclas rivicola; Mähren).—Braun, 1893a, 831, 832; 1893b, 183; 1898a, 1581.—Looss, 1894a, 227 (=C. macrocerca Fil.).

vesiculifera Dies., 1855a, 378, 389, to (Xiphidiocerc.) (C. vesiculosa Fil., 1854, renamed) (in Paludina vivipara); 1858d, 254–255, to (Acanthocephala) (syns. C. vesiculosa Fil.; C. (Xiphidiocerc.) vesiculifera Dies.; C. microcotyla Fil.) (in Pal. vivip., P. achatina).

vesiculosa Dies., 1850a, 295–296 (in Paludina vivipara; based on Cerc. I. Baer, 1827b; Regiomontii, Berlin, Heidelberg); 1855a, 385 to (Eucerc.); 1858d, 254 (of Fil.), syn. of C. (Acanthocephala) vesiculifera, 254 (syn. C. (Eucerc.) vesiculosa Dies.) to (Acanthocephala).—Braun, 1892a, 797, 806.—Erc., 1881e, 9–10, pl. 1, figs. 18–19, 12, 52; 1882a, 245–246, 248, 288 (in Pal. achatina, P. vivip.; Italy).—Fil., 1854a, 12–13, 22, pl. 1, figs. 12–14; 1855b, 23; 1857c, 14–15, 16, 17, pl. 2, figs. 22–23, 24, 25 (in Pal. vivip., P. ach.; Lake Majeur).—Moul., 1856, 81–82, 103–104, 158–159, pl. 5, bis figs. 13, 14; 260 (in Pal. vivip.; Berlin).—Pag., 1857, 21–22, pl. 2, figs. 1–4 (in Pal. vivip.).—Par., 1894, 163.—La Valette, 1855, 19–20, pl. 1, fig. 8.

vesiculosa of Fil., 1854a, 12, 13, 22, 30, pl. 1, figs. 12–14 (in Paludina vivipara).—Dies., 1855a, 389 (renamed C. (Xiphidiocerc.) vesiculifera); 1858d, 254 (syn. of C. (Acanthocephala) vesiculifera Dies.).

villoti Mont., 1888, 194 (C. setifera Müeller of Villot, 1879, in Scrobicularia tenuis, renamed), 195, 197; 1888, 77.—Giard, 1897c, 954.

CERCARIA—Continued.

virgula (Fil., 1837) Dies., 1850a, 296; 1855a, 386, to (Eucerc.); 1858d, 260, to (Acanthocephala) (syn. C. (Eucerc.) virg. Dies.) (larva of Dist. maculosum Rud.) (in Valvata piscinalis, Paludina impura).—Biehringer, 1884, 15, 18.—Braun, 1892a, 749, 809; 1893a, 859.—Fil., 1855b, 5, 10, 19, 22, 23, pl. 1, figs. 5–10 (= Dist. virg.) (in Pal. imp.; Pavia, Moncalier); 1856b, 85; 1857c, 6–7, pl. 1, figs. 9, 10 (in Pal. imp.).—Florance, 1866a, 8.—Harz, 1881c, 4, 7, 8.—Leuck., 1863, 504, 505, 506, fig. 173.—Linst., 1901, 197.—Looss, 1894a, 40.—Moul., 1856a, 51, 82, 99, 104, 161–163 (in Pal. imp.; Pavia Moncalier).—Par., 1894, 163.

viridis Müeller, 1786, 126–127, pl. 19, figs. 6–13 (in aquis fossarum stagnantibus primo vere).—Bory, 1825a, 84.—Bosc 1802a, v. 3, 226.—Bruguière, 1792a, 456., 460–461.—Nitzsch, 1827, 68, to Enchelys.—Schrank, 1803, 80–83.

vitrina Linst., 1887, 105–106, pl. 2, figs. 8, 17c (in Zebrina detrita; Frauenberg b. Sondershausen).—Braun, 1893a, 831.

vittelliloba (Olss., 1876) Ssinitzin, 1906, 683, to (Gorgodera).

vivax Sons., 1892, Oct. 7, 137–138, pl. 18, fig. 3 (in Cleopatra bulimoides; Cairo, Egypt).—Braun, 1893b, 183 (in Cl. bul.).—Looss, 1896b, 210–223, pl. 15, figs. 162–177 (in Cl. bul.; Egypt, Tunis; Melanopsis præmorsa).—Rossbach, 1906, 370.

CERCARIÆ, plural of Cercaria.

gorgoderæ cygnoidis Zeder, 1800, of Kowal., 1904 (9), 24 (in Cyclas cornea; Dublany).

CERCARIÆA Nitzsch, see Dies., 1850a, 286, 292; 1855a, 383–400; 1858d, 241–243.—Goldb., 1855a, 15.—Mont., 1888, 83.

CERCARIÆUM Dies., 1855a, 397–400 (collective group and not as true generic name, for little known and doubtful forms of Cercariæa Nitzsch).—Bettend., 1897a, 4, 5, 7, 9, 12, 23, 30, 32, 33, 37, 39, 41, 42, 43, pl. 1, figs. 1, 2, 3, 5, 7, pl. 2, figs. 11, 15, 16, 17, pl. 3, figs. 18, 19, 20, 21, 22, 23, pl. 4, figs. 24, 25, 30, pl. 5, figs. 31, 32; 1897, 309, 311, 313, 316, 327, 334, 336, 337, 343, 345, 346, pl. 28, figs. 1–3, 5, 7, pl. 29, figs. 11, 15–17, pl. 30, figs. 18–23, pl. 31, figs. 24, 25, 30, pl. 32, figs. 31, 32 (in Helix hortensis).—Blochmann, 1892b, 649–652 (in Helix hortensis).—Blochmann & Bettend., 1895a, 218, 219, figs. 4, 5 (in Helix hortensis).—Brand., 1898a, 214 (22).—Braun, 1893a, 830, 857.—Darr, 1902, 694.—Kowal., 1898h, 158 (55).—Looss, 1894a, 236.—Sons., 1897, 252 (Cercaryæum).

1897: Cercaryæum Sons., 1897, 252, for Cercariæum.

ancyli lacustris Dies., 1855a, 400, based on Baer, 1827b, 656, in Ancylus lacustris; 1858d, 282.

coni mediterranei (Fil., 1857c) Dies., 1858d, 282–283.

coregoni feræ Chavannes, — —, 62, see Dies., 1858d, 283.—Linst., 1879a, 266 (in Coregonus fera Jur.).

cycladis rivicolæ (Dies., 1850) Dies., 1855a, 400 (in Cyclas rivicola); 1858d, 282.—Braun, 1893a, 830.

echinatum (Fil., 1837a) Dies., 1858d, 280 (syn. Heterost. ech. Dies.) (in Paludina impura; Ticinum).

erythrops Dies., 1855a, 400 (based on Cerc. paludinæ impuræ Baer, 1827b) (Regiomontii); 1858d, 270 (to Histrionellina).

flavescens (Pag., 1857) Dies., 1858d, 278 (in Eulimus radiatus; Heidelberg).

helicis Meckel [? see *helicis pomatia*].—Braun, 1891d, 424 (in Helix nemoralis; H. strigella); 1893a, 829, 856.—Hofmann, 1899a, 174, 175, 177, 178–185, 188, 193, 201, pl. 11, figs. 1, 3, 4, pl. 12, figs. 3, 4 (becomes mature in Erinaceus europæus to Dist. leptosomum, syn. D. caudatum).—Roewer, 1906, v. 41, 185–228, figs. 1, 2, 3, pl. 14, figs. 1–7, pl. 15, figs. 8–22; 1906, 5 Oct., 616–617; 1906, 9 Oct., 596–599; 1906, 15 Nov., 340–341.—Ziegler, 1905, 37.

helicis alternata Dies., 1855a, 398 (=Dist. helicis Leidy, renamed) (in Helix alternata; Philadelphia); 1858d, 278 (syn. of C. vagans). Leidy, 1857, 44.

helicis aspersæ Dies., 1855a, 398 (for helicis asperæ Dies., 1850a, 302, based on Duj., 1845a, 472); 1858d, 277 (syn. Cerc. h. a. Moulinie) (in Helix aspersa; Rennes).

helicis pomatiæ (Dies., 1850) Dies., 1855a, 398; 1858d, 278 (syn. Cercaria sagittifera Siebold) (in Helix pomatia).

limacis (Dies., 1850) Dies., 1855a, 397; 1858d, 277 (in Limax agrestis, L. cinereus, L. rufus; Rhedoni).—Braun, 1893a, 831.—Jackson, 1888, 651.

CERCARIÆUM—Continued.

lymnæi auricularis (Fil., 1854) Dies., 1855a, 398; 1858d, 278–279 (in Lymnæus auricularis).

lymnæi palustris Dies., 1855a, 399 (for Heterost. limnæi Dies., 1850a, 302, based on Duj., 1845a, 473) (=Dist. lymnæi Dies., 1850, renamed); 1858d, 279 (in Lymnæus palustris; Rennes).—Sons., 1897, 252.

lymnæi peregri Dies., 1858d, 279 (in Lymnæus pereger; Turin).

melanops Dies., 1855a, 400 (based on Cercaria paludinæ impuræ Baer, 1827b, 655); 1858d, 270 (to Histrionellina).

naidis proboscideæ Dies., 1858d, 283.

ovatum (Dies., 1850) Dies., 1858d, 279–280 (syns. Heterost. ov. Dies., Dist. luteum La Valette) (adult=Dist. luteum Wagener, in Esox lucius) (in Paludina vivipara) (Berlin, Heidelberg, Regiomontii).—Mont., 1893, 190.

paludinæ impuræ (Fil., 1854) Dies., 1855a, 399 (in Paludina impura); 1858d, 280 (syn. of C. pal. imp. inerme).

paludinæ impuræ armatum (Fil., 1854a) Dies., 1858d, 281 (in Paludina impura).—Par., 1894, 161 (in Bythinia tentaculata).

paludinæ impuræ inerme (Fil., 1854a) Dies., 1858d, 280 (syns. C. pal. imp. Dies., Cerc. pal. inerme Morl., Dist. pal. imp. inerme Fil., adult=Dist. perlatum Nord.) (in Paludina impura).—Linst., 1873, 1 (larva of Dist. perlatum Nord.).—Par., 1894, 162 (in Bythinia tentaculata; Pisa).

paludinæ impuræ (tentaculorum) Dies., 1855a, 399 (based on Dist. pal. imp. Baer, 1827b, 655) (in Paludina impura; Regiomontii); 1858d, 281.

paludinæ viviparæ Dies., 1855a, 399 (=Cercaria helicis viviparæ Dies., 1850a, 298, renamed); 1858d, 279 (in Paludina vivipara; Vilnae).

physæ fontinalis (Baer, 1827) Dies., 1855a, 400; 1858d, 282.

planorbis carinati (Fil., 1857) Dies., 1858d, 281–282.

planorbis cornei (Dies., 1850) Dies., 1855a, 400; 1858d, 281 (syn. of C. plan. cornei (ovariorum)).

planorbis cornei (hepatis) Dies., 1858d, 281 (in Planorbis corneus).

planorbis cornei (ovariorum) Dies., 1858d, 281 (syn. C. planorbis cornei Dies.) (in Planorbis corneus).

spinulosum Hofmann, 1899a, 178, 185, 193, 201, pl. 11, fig. 2, of pulmonates, see Dist. spinulosum of Erinaceus europæus.

tellinæ balticæ (Dies., 1850) Dies., 1855a, 400; 1858d, 283.—Braun, 1893a, 830.—Pag., 1862, 298.

vagans (Leidy, 1850) Dies., 1855a, 398; 1858d, 278 (syns. Dist. helicis Leidy, D. pericardium Crep., D. vagans Leidy, C. helicis alternatæ Dies.) (in Helix albolabris, H. alternata; Philadelphia).

CERCARYÆUM Sons., 1897, 252, for Cercariæum.

CERCORCHIS Luehe, 1900aa, 566 (tod. linstowi), subg. of Telorchis; *κέρκος*, tail.—Braun, 1901a, 14; 1901b, 58; 1901i, 58.—Looss, 1902m, 831, 832, 834, 835.

1899: Telorchis Looss, 1899b, 566 (tod. linstowi).

linstowi[i] (Stoss., 1890) Luehe, 1900aa, 566.

CHARAXICEPHALUS Looss, 1901l, 7 Nov., 621–622 (m. robustus); 1902, 541, 542, 562, 579, 582, 589, 590, 591, 596, 597, 598, 599, 600, 601, 602, 609, 611, 612–613 (diagnosis) (Pronocephalidæ).—Pratt, 1902a, 890, 910 (key).

robustus Looss, 1901l, 621–622 (in Chelone mydas; Egyptian coast); 1902m, 416, 541–545, pl. 25, figs. 65–69, pl. 26, fig. 89, 548, 597, 599, 612.

CHEILOSTOMUM Dies., 1850a, 286, 293 (m. varicans); 1855a, 379, 381, 394; 1858d, 273.—Burm., 1856a, 250.—Fil., 1857c, 8.—Goldb., 1855a, 15.—Moul., 1856a, 121, 123.

varicans (Abildg., 1794) Dies., 1850a, 293; 1855a, 394 (Hab. primitivum ignotum); 1858d, 273 (free; Dania).—Moul., 1856a, 213 (to Cerc.).—Pag., 1857, 6.

CHIORCHIS Fischder., 1901, 374 (m. fabaceus); 1902a, 43–44.—Looss, 1902m, 442.—Pratt, 1902a, 887, 893 (key).—Shipley, 1905, v. 6, 8.

dilatatus Daday, 1905, 233 (in Colossoma brachypoma; Paraguay).

fabaceus (Dies., 1839) Fischder., 1901, 374; 1902a, 44–46, 53 (in Manatus exunguis, M. latirostris; Brazil and North America); 1903h, 528.

oxycephalus (Dies., 1836) Daday, 1905, 233 (in Colossoma brachypoma).

CHONCHOSOMUM Galli-Valerio, 1901c, 364, for Conchosomum.

alatum (Goeze, 1782) Galli-Valerio, 1901c, 364 (in dog).

CHORICOTILE Parona & Perugia, 1889, 743, (for Choricotyle).

CHORICOTYLE Ben. & Hesse, 1863; 1864, 96, 109 (m. chrysophryi).—Braun, 1890a, 477, 498, 516, 517, 522, 546.—Cerf., 1895h, 918, 920; 1896, 514, 515.—Mont., 1888, 8, 11, 86, 89, 99; 1903, 336 (syn. of Diclidophora).—Par. & Per., 1890, 10, 13.—Tasch., 1879, 240.

1889: Choricotile Par. & Perugia, 1889, 743, for Choricotyle.

chryophrii Cerf., 1898a, 303 (for chrysophryi).

chrysophris Mont., 1888, 11, 16 (for chrysophryi).

chrysophryi Ben. & Hesse, 1863; 1864, 109–110, pl. 11, figs. 16–22 (in Chrysophrys aurata).—Cerf., 1898a, 303 (chryophrii).—Mont., 1888, 11, 16 (chrysophris).—Tasch., 1879, 247 (to Octobothrium).

marionis St. Loup, 1885, 176 (in Mæna vulgaris).

taschenbergii Par. & Perugia, 1889, 743 (Choricotile); 1890, 743 (Choricotile) (in Sargus rondeletii; Genova); 1890, 6.—Braun, 1890a, 418, 535, to Octobothrium.—Cerf., 1898a, 303.

CLACOCŒLIUM Stiles & Hass., 1898a, 89, misprint for Cladocœlium.

CLADOCALIUM Pontallié, 1853, 104, 105 (misprint for Cladocœlium).—Stiles, 1904i, 21.—Stiles & Hass., 1898, 86, 89.

CLADOCŒLIUM Duj., 1845a, 382, 388, 389 (m. hepaticum), as subg. of Dist.—R. Bl., 1891, 609, 610.—Braun, 1893a, 885, 886, 909, 910; 1895, 138.—Looss, 1899b, 535.—Mont., 1888, 38, 92, 105; 1893, 150, 154.—Stiles, 1904i, 21.—Stiles & Hass., 1898a, 86, 89 (Clacocalium).—Stoss., 1892, 4, 7, raised to generic rank.

1853: Cladocalium Pontallié, 1853, 104, 105, misprint.

1898: Clacocœlium Stiles & Hass., 1898a, 89, misprint.

delphini (Poir., 1886) Stoss., 1892, 10 (in Delphinus delphis).

elephantis (Dies., 1858) Stoss., 1892, 9 (in Elephas indicus; Rangoon).

giganteum (Dies., 1858) Stoss., 1892, 9–10 (syns. Dist. gig., Fasc. gig., Dist. magnum) (in Camelopardalis giraffa, Cervus aristotelis, C. canadensis, C. elaphus, Dama vulgaris, Portax picta).—Stiles, 1898a, 49, 51; 1904i.—Ward, 1895, 253 (syn. of Fasc. magna); 1903, 866 (in part syn. of Fasc. magna).

hepaticum (Linn., 1758) Stoss., 1892, 7–9 (syns. Fasc. hepat., Dist. hepat., Dist. caviæ) (in Antilope dorcas; Bos bubalis, Egitto; B. taurus; Padova, America; Camelus bactrianus, Cavia cobaja, Capra hircus, Cervus capreolus, C. elaphus; C. virginianus, North America; Castor fiber, Dama vulgaris, Elaphus indicus, Equus asinus, E. caballus, Padova, North America; Felis domestica, Homo, Dalmazia, Spagna, Zurigo, Liverpool; Lepus cuniculus, L. timidus, Macropus giganteus; Ovis aries, Padova, Normandia, Mecklenburg, Offenbach, Buenos Aires; Ovis argali; Portax picta, India; Sus scrofa).—Braun, 1903, 147 (to Fasc.); 1906, 150, fig. 83 (to Fasc.).—Duj., 1845a, 389.—Rail., 1893a, 342.—Stiles, 1898a, 29; 1904i, 22.—Ward, 1895, 327 (in Homo); 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus); 1903, 865 (to Fasc.).

holostomum (Rud., 1819) Stoss., 1892, 145.—Braun, 1902b, 136, syn. of Urogonimus macrostomus.

palliatum (Looss, 1885) Stoss., 1892, 10–11 (in Delphinus delphis).

rochebruni (Poir., 1886) Stoss., 1892, 11 (in Delphinus delphis).

sulcatum (Linst., 1883) Stoss., 1892, 145.

(CLADOCŒLIUM) Duj., 1845a, 382, 388, 389 (m. hepaticum), subg. of Dist.

hepaticum (Linn., 1758) Duj., 1845a, 389–390, see Fasc.

macrocotyle (Dies., 1858) Stoss., 1886, 63.

miescheri Zschokke, 1890, 764 (in Trutta salar).

pagelli (Ben., 1870) Stoss., 1886, 59.

veliporum (Crep., 1837) Stoss., 1886, 64.

CLADORCHINÆ Fischder., 1901a, 372; 1902a, 35; 1903h, 490, subf. of Paramphistomidæ.—Looss, 1902m, 439.—Pratt, 1902a, 887, 892 (key), includes Gastrodiscus, Homalogaster, Diplodiscus, Cladorchis, Chiorchis; related genus Balanorchis.—MacCallum, 1905, 668.—Shipley, 1905, v. 6, 4, 8.—Stiles, 1904i, 45.

CLADORCHIS Fischder., 1901a, 372 (tod. pyriformis); 1902a, 35–36, 43, 45.—Looss, 1902m, 836.—MacCallum, 1905, 668.—Pratt, 1902a, 887, 893 (key).—Shipley, 1905, v. 6, 8.

asper (Dies., 1839) Fischder., 1901, 373; 1902a, 39 (in Tapirus americanus); 1903f, 602–606, pl. 29, figs. 82–85.

giganteus (Dies., 1836d) Fischder., 1901, 373 to (Stichorchis); 1902a, 41–42, 43 (in Dicotyles albirostris, D. torquatus); 1903f, 611–614, pl. 30, figs. 89–92.

helostomatis MacCallum, 1905, 673–678, fig. B (in Helostoma temmincki; Palembang, Sumatra).

pangasii MacCallum, 1905, 668–673, fig. A (in Pangasius nasutus; Palembang, Sumatra).

pyriformis (Dies., 1839) Fischder., 1901, 373; 1902a, 36–38, 39, fig. 3 (in Tapirus americanus); 1903h, 596–602, figs. 78–81.

schistocotyle Fischder., 1901, 373, to (Taxorchis) (in Dicotyles torquatus); 1902a, 40–41 (syn. Amphist. giganteum Dies., 1835 e. p.; Brazil), to (Taxorchis) (in Dic. torq.); 1903f, 607–610, pl. 29, figs. 86–87, pl. 30, fig. 88 (schistolotyle).

subtriquetrus (Rud., 1814) Fischder., 1901, 373–374, to (Stichorchis); 1902a, 35, 42–43, to (Stichorchis) (syns. Amphist. subtriq. Rud., Dist. amphistomoides Boj.) (in Castor fiber); 1903h, 567, to (Stichorchis); 1903f, 615–620, pl. 30, figs. 93–96.

watsoni (Conyngham, 1904) Shipley, 1905, 129–135, pl. 4, figs. 1–10 (in Homo; Africa); 1905, 1–9, pl. 4, figs. 1–10; 1905, April, 205; 1905, 8 April, 950; 1905, 2 Nov., 1298; 1905, 9 pp., 10 figs., 190.

CLINOSTOMIDÆ Luehe, 1901, 488.—Looss, 1902m, 839 (includes Clinost., Harmost., Ityogonimus, Urotocus, Hapalotrema.—Odhn., 1902, 42.

CLINOSTOMINÆ Pratt, 1902a, 889, 907 (key), includes Clinost., Nephrocephalus; additional genera Sperost., Microlistrum, Mesotretes, Hapalometra, and Distoma oricola).—Odhn., 1902, 42.

CLINOSTOMUM Leidy, 1856, 45 (tld. gracile)[a] [not Clinostomus Giard, 1856, 211, fish].—Braun, 1893a, 886, 887, 894; 1899, 1, 3; 1899, 465; 1899g, 484–488, 489–493; 1899h, 1–3; 1900h, 1–48, pls. 1–2, figs. 1–20; 1900c, 24–32; 1900, 27, 31; 1901b, 9, 34; 1901, 561; 1904, v. 2 (3), 24–25.—Darr, 1902, 655.—Looss, 1899b, 649–651 (see æquale, heteroclitum, commutatum); 1902m, 839.—Luehe, 1899, 538; 1900, 557; 1901, 488.—MacCallum, 1899, 707.—Mont., 1893, 156.—Odhn., 1902, 29, 42.—Stiles & Hass., 1898a, 86 (gracile, designated type), 96.—Odhn., 1902, 29.—Pratt, 1902a, 889, 907 (key).—Stiles, 1901, 184.

africanum Stoss., 1906, in Galli-Valerio, 1906, 49–50, fig. 2 , in int. of fish; French Kongo.

complanatum (Rud., 1814) Braun, 1899g, 490, 491 (in Ardea cinerea; Berlin); 1900, 27–28, 31; 1900h, 23–25, 26, 41, 42, pl. 1, figs 6, 7.—Stoss., 1901, 97 (9) (in Ardea cinerea; Albona).

detruncatum Braun, 1899g, 490 (Dist. dimorphum Dies., p. p.) (in Mycteria americana, Ciconia americana; Brazil); 1900, 29–30, 31; 1900h, 28, 32–34, 35, 37, 39, 40, pl. 2, fig. 11.

dimorphum (Dies., 1850) Braun, 1899g, 490 (in Ardea cocoi; Brazil); 1900h, 12, 36–38, pl. 1, figs. 3, 9, pl. 2, figs. 12, 18; 1900, 29, 31.—Looss, 1899b, 650.

dubium Leidy, 1856, 45 (in Rusticola minor); 1904a, 88.—Braun, 1899g, 484; 1900h, 2.—Cobbold, 1859, 10.—Dies., 1858e, 336.—Stoss., 1892, 181.—Stiles & Hass., 1898a, 86.

foliiforme Braun, 1899g, 490 (in Ardea purpurea; Italy); 1899h, 2; 1900h, 20, 30–32, 42, pl. 1, fig. 5.

gracile Leidy, 1856, 45 (in Pomotis vulgaris, encysted; Esox, intest.); 1904a, 88.—Brand., 1898a, 203 (11).—Braun, 1892a, 651; 1899g, 484, 486, 491 (doubts exist as to identity of gracile and heterostomum); 1900h, 2, 4, 5, 6, 13, 42; 1900, 26, 31.—Dies., 1858e, 336 to Dist.—Looss, 1894a, 137, 138, 171; 1899b, 585, 649, 650, 651 (gracile not identical with heterostomum).—MacCallum, 1899a, 704, 705, 707, 708.—Mont., 1888a, 92; 1893, 155.—Staff., 1904, May 3, 493 (gills of Perca flavescens Mit.; Canada).—Stiles, 1901, 176.—Stiles & Hass., 1894, 414; 1898a, 86, 96 (type of C. and syn. of Dist. heterostomum Rud.).

[a] Looss considers that gracile is not the young form of heterostomum, but he accepts the latter as type; this is doubtless a lapsus.

CLINOSTOMUM—Continued.

heluans Braun, 1899g, 490 (in Ardea cœrulea and Nycticorax gardeni; Rio de Janeiro); 1900, 30, 31; 1900h, 8, 11, 39–41, pl. 2, fig. 10.

heterostomum (Rud., 1809) Braun, 1899g, 487, 489–490 [t. h. Ardea purpurea; t. l. apparently Europe]; 1900c, 30–31; 1900h, 11, 19–22 (includes Dist. het. Rud., 1809a, 381; 1819a, 102, 388; Duj., 1845a, 400; Dies., 1850a, 353; Stoss., 1892, 64; Par., 1896, no. 258; D. hians p. p. Par., 1887, 331 from Nycticorax griseus), figs. 1–2, (29), 42, (44, 45); 1902b, 124.—Looss, 1899, 650.

heterostomum MacCallum, 1899a, 697–710, figs. 1–7 (in Ardea herodias; Dunville, Ontario, Canada).—Braun, 1900e, 140–141 (identical with Dist. marginatum Rud. and ? D. complanatum Rud. and ? D. heterostomum Wright); 1900h, 29, 45 (syn. of Clinost. marginatum); 1904, 23.

lambitans Braun, 1899g, 490 ("in Schlunde eines Reihers; Semanabay, Westindien"); 1900c, 30, 31; 1900h, 41–42, pl. 2, figs. 16, 17.

marginatum (Rud., 1819) Braun, 1899g, 490 (in Ardea sp., Brazil; Ardea cocoi and Mycteria americana in Brazil), 491; 1900c, 28, 31; 1900h, 25–30, 32, 37, 41, 45, 46, pl. 1, figs. 4, 8, pl. 2, figs. 19, 20.

reticulatum (Looss, 1885) Braun, 1899g, 491.—Looss, 1899, 651.

sorbens Braun, 1899g, 490 (in Tantalus loculator; Brazil); 1900c, 30, 31; 1900h, 34, 37, 45, pl. 2, figs. 13–15; 1902b, 129.

CLONORCHIS Looss, 1907, Feb. 1, 147–152 (tod. sinensis).

endemicus (Baelz, 1883) Looss, 1907, Feb. 1, 150–152.

sinensis (Cobbold, 1875) Looss, 1907, Feb. 1, 148–150 (syn. Dist. innocuum Baelz, 1883).

CODONOCEPHALUS Dies., 1850a, 287, 317–318 (m. mutabilis); 1858e, 312, 323, 393.—Brand., 1888a, 12, 13, 51; 1890a, 578.—Braun, 1894l, 166; 1895b, 132.—Goldb., 1855a, 17.—Mont., 1888, 84, 92.—Moul., 1856a, 16.—Villot, 1898, 542.

mutabilis Dies., 1850a, 317–318, Amphist urnigerum Rud., 1819, renamed (in Pelophylax esculentus); 1858e, 323 (in Pel. esc.).—Baird, 1853a, 49 (=Holst. urn. Duj.).—Brand., 1888a, 13.—Braun, 1892a, 796; 1893a, 870; 1894, 167.—Gastaldi, 1854a, 14 pp., 2 pls.—Giebel, 1857, 266 (Amphist. urn. Rud).—Hannover, 1864a, 3, 4.—Mol., 1858, 128; 1859, 818–819, pl. 1, fig. 2 (in Pel. esc.; Padua); 1861, 197.—Mueh., 1898, 16.—Sons., 1893, 188, 190 (syns. Amphist. urn. Rud.; Holost. urn. Duj.) (in Rana esculenta L.).

CŒNOGONIMINÆ Looss, 1899b, Dec., 573, 583–584, 586, 619; 1902, 839.—Jægers., 1903a, 14, 15.—Luehe, 1901, 488.—Odhn., 1900, 13, 21; 1905, 314.

CŒNOGONIMUS Looss, 1899b, Dec., 585, 586, 619 (tod. heterophyes); κοινός, gemeinsam; γόνιμος, Erzeugende; 1900d, 608; 1902m, 515, 833, 835.—Braun, 1901b, 56; 1901e, 334 (syn. of Cotylogonimus Luehe); 1901i, 56.—Jægers., 1900c, 736; 1903a, 10, 11, 13, 15.—Luehe, 1900aa, 557.—Odhn., 1900, 21, 22.—Ofenheim, 1900, 183.—Stiles, 1904i, 43.—Stiles & Hass., 1900a, 563.

fraternum (Looss, 1894) Jægers., 1903a, 3, for fraternus.

fraternus (Looss, 1894) Looss, 1899b, 585, 700–701; 1901b, 205.

heterophyes (Sieb., 1853) Looss, 1899b, 585, 678, 699–700, 701.—Braun, 1903, 164 (to Cotylogonimus).—Jægers., 1903a, 3.—Ward, 1903, 870.

COLEPS Nitzsch, 1827, 69 (m. Cerc. hirta).

CONCHOSOMA Stoss., 1898, 20, for Conchosomum, q. v.

CONCHOSOMINÆ Rail., 1896, 160.

CONCHOSOMUM Rail., 1896, Mar. 15, 160, Hemist. Dies., 1850 [not Swainson] renamed, tod. alatum.—Stoss., 1898, 20.—See also Alaria 1788.

1898: Conchosoma Stoss., 1898, 20.

1901: Chonchosomum Galli-Valerio, 1901c, 364.

alatum (Gœze, 1782) Rail., 1896, 160 (in intest. of Canidæ).—Piana, 1898, 3.

spathaceum (Rud., 1819) Stoss., 1898, 20–21 (in Larus canus, L. argentatus michahelesii; Triest).

spatula (Dies., 1836) Stoss., 1898, 20 (in Buteo vulgaris at Triest, Iamiano; Falco peregrinus at Ospo; Circus aeruginosus at Verteneglio, Monfalcone, Doberdò, Iamiano).—See spathula.

COSMOCOTYLEA Dies., 1858c, 313, 360, 365 (subf. of Monocotylea, contains Gasterost., Rhipidocotyle, Callicotyle).—Tasch., 1878, 565, 566.

COTYLAGASTER Mont., 1904, 65, misprint for Cotylogaster.

COTYLASPIS Leidy, 1857a, 18 (m. insignis); 1858a, 110; 1904a, 110.—Braun, 1893a, 886, 887, 888, 891, 894, 896.—Dies., 1859c, 438–439.—Hoyle, 1890, 539 (one species; in Anodonta).—Jackson, 1888, 650 (endoparasitic, American Anodonta), 654.—Kofoid, 1899, 180, 181, 182, 183, 184.—Mont., 1888, 89, 91, 1892, Oct. 7, 196, 197, 198, 199, (syn. of Aspidogaster) 202.—Nickerson, 1902; 599, 603, 604, 605, 612, 613, 615, 617.—Pratt, 1902a, 887, 891 (key).—Shipley & Hornell, 1904, 98.—Tasch., 1879, 259.

insignis Leidy, 1857a, 18 (in Anodonta fluviatilis, A. lacustris); 1858a, 110.—Dies., 1859c, 439.—Kofoid, 1899a, 179–186 (identity with Platyaspis anodontæ); 1899b, 179–186.—Mont., 1892, Oct. 7, 197, 201 (syn. of Aspidogaster conchicola),202.—Nickerson, 1902, 612, 613, 614, 619(in Unionidæ; North America).—Osborn, 1905a, 201–242 (habits and structure), figs. 1 (a–f), 1–81; 1905, 201–242, 3 pls., 1 fig.; 1905, 317–318.—Tasch., 1879, 259 (in Anod. fluv., A. lac.; North America).—Also reported for Anodonta corpulenta, Unio alatus, U. anadontoides, U. confragosus, U. edentulus, U. elegans, U. gracilis, U. katharinæ, U. ligamentinus, U. rectus, U. tuberculatus).

lenoiri (Poir., 1886) Nickerson, 1902, 613, 614, 619 (in Tetrathyra; Senegal).

COTYLEA Dies., 1850a, 286, 293 [not of Mont., 1891, 111], subtribe of Dicranocœla to contain Rhopalocerca, Bucephalus, Malleolus, Cerc., Histrionella, Diplocotyle.—Goldb., 1855a, 15.

COTYLEGASTER Sieb., 1877 MS. in Cobbold, 1877e, 235, 237 (lapsus for Aspidocotylus) [not Cotylogaster Mont., 1892].

cochleariforme (Dies., 1838) Sieb., 1877 MS. in Cobbold, 1877e, 235, 237 (lapsus), see Gastrodiscus sonsinoii; 1879b, 360 (syn. Aspidogaster cochleariformis) "not to be confused with Gastrodiscus."—Ward, 1895, 338 ("error—Gastrodiscus ægyptiacus," in Equus caballus).

cochleariformis (Dies., 1838) Zuern, 1882, 222 (see cochleariforme).—Lejtenyi, 1881a, 1.—Sons., 1895, 179, 180; 1896, 297.

COTYLOCEPHALA Dies., 1858e, 315 (f. of Trematoda plectanophora to contain subf. Aplacoplectana, Placoplectana), 382.—Ben. & Hesse, 1864, 95.—Mont., 1888a, 84.

COTYLOGASTER Mont., 1892a, Oct. 7, 168, 169, 170, 173, 174, 175, 176, 177, 179, 180, 183, 184, 185, 186, 187 (Aspylogaster), 188, 189, 190, 191, 194, 195, 196, 197, 198, 206[a] (m. michælis), 213 (g. of Aspidobothridæ); 1893, 37, 111, 114, 202, 205, 206, 209.—Braun, 1893a, 888, 890, 891, 894, 896, 897, 917, 918; 1893b, 177, 178, 179, 182, 188.—Gamb., 1896, 73.—Kofoid, 1899, 182.—Lejtenyi, 1881a, 2.—Looss, 1894a, 131, 134; 1902, 428, 429.—Nickerson, 1902, 602, 604, 606, 610, 611, 612, 617.—Pratt, 1902a, 887, 891 (key).—Stoss., 1898, 19.

1892: Aspylogaster Mont., 1892, Oct. 7, 187, for Cotylogaster.

michælis Mont., 1892, Oct. 7, 168-173, 198, 206–207, pls. 21–22 (in Cantharus vulgaris; Triest); 1893, 52, 82, 145, 202; 1902, 139.—Braun, 1893a, 887, 898; 1893b, 184.—Jægers., 1899, 203, 207.—Looss, 1902, 420, 421, 428.—Nickerson, 1902, 597, 598, 599, 600, 601, 602, 603, 605, 606, 610, 611, 618 (in Can. vulg.; Triest).—Stoss., 1898, 19; 1899, 3.

occidentalis Nickerson, 1900, Feb. 16, 250 (in Sheepshead; Mississippi Valley); 1901, Mar. 8, 378; 1902, 597–624, pl. 32, figs. 1–7, pl. 33, figs. 8–21 (in Aplodinotus grunniens; Minnesota).

COTYLOGONIMINÆ Pratt, 1902a, 888, 897 (key), includes Cotylogonimus and Cryptocotyle.

COTYLOGONIMUS Luche, 1899k, Dec., 538, 539 (tod. heterophyes); 1900, 555, 557.—Braun, 1900h, 6; 1901e, 334, 338; 1901i, 56; 1903, 164; 1906, 171–172.—Pratt, 1902a, 888, 898 (key).—Looss, 1900, 607; 1902, 813, 833.—Stiles, 1904i, 43.—See Heterophyes.

[*concavum* (Crep., 1825), 1899 to (Cryptocotyle).]

fraternus (Looss, 1894) Braun, 1901e, 337.—Fischder., 1903h, 548.

heterophyes (Sieb., 1853) [Luche, 1899k, 539].—Braun, 1901e, 335, 337, 338; 1903, 3 ed., 164–166, fig. 114; 1906, 136, fig. 71, 172–173, fig. 105.—Fischder., 1903h, 548.—Ward, 1903, 870 (to Heterophyes).—Type of Heterophyes, q. v.

persicus Braun, 1901e, 334–338, pl. 20, fig. 13 (in Persian wolf).

COTYLOPHORA Mont., 1888a, 84, 93, for Trematoda cotylophora Dies., 1858e, 312, a subtribe containing fams. Monocotylea, Tricotylea, Polycotylea [not Cotylophori Mayer, 1841a, 24, 25].

COTYLOTRETUS Odhn., 1902, 32 (m. rugosus).—Pratt, 1902a, 888, 897 (key).

rugosus Odhn., 1902, 32–45, fig. 3 (in Coluber pullatus = Spilotes pullatus).

CRANIOCEPHALA Mont., 1905, 21–24 (m. birói), a temnocephala; *κράνειον*, cornelian-tree.

birói Mont., 1905, 21–24 (named after L. Biró), figs. 1–2 (in Sesarma gracilipes A. Edw.; Sattelberg, New Guinea).

CRASPEDELLA Haswell, 1893e, 96, 98, 99, 112, 114, 132, 141, 143, 145 (m. spenceri); 1893f, 154.—Mont., 1899, 84, 115, 116, 117, 120, 121.—Pratt, 1900a, 646, 647 (key).—St.-Remy, 1898, 522, 529.

spenceri Haswell, 1893e, 97, 98, 113, 142, pl. 13, fig. 21, pl. 15, fig. 3 (in Astacopsis bicarinatus); 1900, 433.—Mont., 1899, 84, 121 type (in Ast. bic.; Austr.).—Pratt, 1900a, 655, 657, fig. 2.—St.-Remy, 1898, 529–530, fig. 1 (in Ast. bic.).

CREADIINÆ Looss, 1899b, Dec., 571.—Luehe, 1900, 487.—Odhn., 1901, 483.

CREADIUM Looss, 1899b, Dec., 570–571, 574, 580, 595 [not Creadium, Creadion Vieill., 1816, bird] tod. isoporum; 1900d, 3 Dec., 602 (renamed Allocreadium).—Braun, 1900, 232; 1901b, 33.—Luehe, 1900, 487, 489; 1901, 397.—Odhn., 1901, 483.—Stiles, 1901, 189.—[See also Dist. commune, D. scorpænæ, D. fasciatum, D. sophiæ, D. bacillare, D. pedicellatum, D. album, D. mormyri, D. obovatum.—Looss, 1899b, 571.

angusticolle (Hausmann, 1896) Looss, 1899b, 571 [possibly identical with D. commune Olss., 1868, 31].

isoporum (Looss, 1894) Looss, 1899b, 570, 571, 595.

pegorchis Stoss., 1901, descr. of pl. 6, fig. 4, see Allocreadium.

CREPIDASTOMUM Pratt, 1902a, 888, 896, misprint for Crepidostomum.

CREPIDOSTOMUM Braun, 1900b, 232 (tod. metœcus); 1901b, 31, 33.—Heymann, 1905, 83, 89 (Fasciolidæ, Bunoderinæ).—Looss, 1902, 452, 453, 454.—Odhn., 1905, 296.—Pratt, 1902a, 888 (Crepidast., Fasciolidæ, Psilostominæ), 896 (key).—Staff., 1904, 491.

1902: Crepidastomum Pratt, 1902a, 888, 896, misprint.

cornutum (Osborn, 1903) Staff., 1904, May 8, 490 (int. of Ambloplites rupestris Raf.; Canada), 491.

laureatum (Zed., 1800) Braun, 1900b, 232 (in fish).—Heymann, 1905, 87.—Looss, 1901, 564; 1902, 452, 453.—Odhn., 1905, 296.—Staff., 1904, May 3, 490 (int. Salvelinus fontinalis Mit.; Canada), 1. var. in Perca flavescens and Stizostedion vitreum, 2. var. in Necturus maculatus; 1905, Apr. 11, 682 (int. Necturus maculatus; Canada).

metœcus (Braun, 1900) Braun, 1900b, 230–232, pl. 10, fig. 13.—Heymann, 1905, 87.—Looss, 1901, 564; 1902, 451 (in Vespertilio lasiopterus), 452, 453.—Odhn., 1905, 296.

CRICOCEPHALUS Looss, 1899b, Dec., 551, 666–667 (tod. delitescens), *ὁ κρίκος*, ring; 1901b, 209; 19011, 620; 1902m, 531, 532, 534, 536, 537, 540, 542, 547, 562, 570, 576, 579, 580, 581, 582, 583, 585, 586, 587, 589, 591, 593, 599, 600, 601, 603, 604, 605, 609, 612, 614[a] (delitescens=albus).—Braun, 1901a, 50.—Pratt, 1902a, 890, 910 (key).

albus (Kuhl & Hasselt, 1822) Looss, 1899b, 667; 19011, 621; 1902m, 511, 532 (syn. delitescens), pl. 25, fig. 64; pl. 32, figs. 170–174; 533, 535, 536, 537, 539, 540, 541, 600, 605, 614.—Braun, 1901a, 45, figs. 10, 13, 15, 16.

delitescens Looss, 1899b, 666, 667, 759–762 (in Chelonia mydas; apparently Egypt), 773, figs. 76–80; 1902m, 531, 532 (syn. of Cr. albus), 549, 605.—Braun, 1901b, 38, 44, 45, 48.

megastomus Looss, 1902, 533–536, 540, 541, 605, pl. 25, figs. 57–60, pl. 27, fig. 90 in Chelone mydas; Egyptian coast).

resectus Looss, 1902m, 537–541, 813, pl. 25, figs. 61–63, 813 (in Chelone mydas; Egyptian coast).

ruber Kuhl & Hasselt, 1822 Looss, 1899, 762.

CROBYLOPHORUS Kroyer, 1852–53a, 813 (m. chimæræ).—Dies., 1859c, 447 (syn. of Gyrocotyle).

chimæra Kroyer, 1852–1853a, 813, 1226–1227 (in Chimæra monstrosa L.).—Dies., 1859c, 447 (syn. of Gyrocotyle amphiptyches).

CROSSEDERA Mont., 1888, 92 (for Crossodera).

(CROSSODERA) Duj., 1845a, 382, 389, 434–437 [not Gould, 1837, aves], subg. (tld. nodulosa) of Dist.: raised to generic rank by Cobbold, 1860a, 31. See Crossodera.—Mont., 1888a, 12.—Stiles & Hass., 1898a, 84 (syn. of Bunodera).

auriculatum (Wedl, 1857) Stoss., 1886, 63.

campanula Duj., 1845a, 435, as doubtful (in Esox lucius; Rennes, France).

crucibulum (Rud., 1819) Duj., 1845a, 363, 435.

excisum (Rud., 1819) Duj., 1845a, 436–437.

laureatum (Zed., 1800) Duj., 1845a, 435–436. See Crossodera.

nodulosum (Frœlich, 1791) Duj., 1845a, 434–435.—Stiles & Hass., 1898a, 85 (designated type of subg). See Crossodera.

papilliferum (Mol., 1861) Stoss., 1886, 60.

verrucosum (Busch, 1851) Stoss., 1886, 61.

CROSSODERA (Duj., 1845a, tld. nodulosa [nec Crossodera Gould, 1837, aves]) Cobbold, 1860a, 31–32.—R. Bl., 1891, 609.—Braun, 1893a, 885, 890, 909, 911; 1900b, 232; 1900h, 3.—Fil., 1857c, 14.—Hass., 1896a, 7 (syn. of Bunodera Rail.).—Looss, 1899b, 535, 538, 542, 580, 594, 598.—Mont., 1888, 92 (Crossedera), 105; 1892, Oct. 7, 214 (g. of Distominæ); 1893, 150, 152, 153, 155.—Rail., 1896, 160 (renamed Bunodera).—Stiles, 1901, 197.—Stiles & Hass., 1898a, 84, 85 (nodulosa type by designation), 87.—Stoss., 1892, 4, 5; 1899, 11.—Wagener, 1860, 165.

1888: Crossedera Mont., 1888, 92, misprint.

campanula (Duj., 1845) Cobbold, 1860a, 32 (in Esox lucius).

laureata (Zed., 1800) Cobbold, 1860a, 32 (in Salmo trutta, S. fario, S. umbla, Thymallus vexillifer).

linearis (Rud., 1793) Cobbold, 1860a, 32 (in Phasianus gallus).—Hass., 1896a, 2 (in Gallus dom.).—Rail., 1893a, 368.—Stoss., 1892, 146.

nodulosa (Frœlich, 1791) Cobbold, 1860a, 32 (in Perca fluviatilis, Acerina vulgaris, Aspro vulgaris, A. zingel, Lucioperca sandra, Esox lucius, Barbus communis).

papillosa (Dies., 1850) Cobbold, 1860a 32 (in Beroë rufescens) (syn. Dist. beroës Will).

CRUMENA Nitzsch, 1827, 68–69 (m. Cerc. crumena).

(CRYPTOCOTYLE) Luehe, 1899, 539 (tod. concavum), subg. of Cotylogonimus; 1900, 557.—Braun, 1900h, 6; 1901b, 56; 1901i, 56.—Jægers., 1901, 981.—Looss, 1900, 607 (type concavum); 1902, 813, 833.—Pratt, 1902a, 888, 897 (key).

concavum (Crep., 1825) Fischder, 1903h, 548.

lingua (Crep., 1825) Fischder, 1903h, 548.

CRYPTOGONIMUS Osborn, 1903, 315–318 (m. chili); 1903, 533–534.—Marshall & Gilbert, 1905, 479.

chili Osborn, 1903, 315–318, fig. 2 (in Micropterus dolomieu; Chautauqua); 1903, 533–534; 1904, 308.—Marshall & Gilbert, 1905, 478.—Staff., 1905, 682 (in Ambloplites rupestris Raf.).

CRYPTOSTOMUM Nitzsch, 1819, sub Amphist.—See Nord., 1832a, 30, 50 (syn. Holost. cuticola); 1840, 561, 628.—Moul., 1856a, 15 (syn. of Hemist.).—[Not Cryptostoma Blainv., 1818, mollusk; Cryptostoma Latr., 1825, coleopteron; Cryptostomus Blainv., 1818, mollusk.]

CUCULANUS Mueller, 1777.—See Nematoda.

conoideus Bloch, 1782a, 35, pl. 10, figs. 5–7 (Cuculanus) (t. h. Anas boschas dom.; Europe).—Dies., 1850a, 383 (syn. of Dist. echinatum).—Herbst, 1787a, 42.—Looss, 1899b, 680.—Mueller, 1788b, 18.—Rail., 1886, 297 (to Dist.).—Rud., 1809a, 418, 420, 432.

CYATHOCOTYLE Much., 1896, v. 20, 590 (m. prussica) (Holostomidæ); 1897, v. 1, in 243–279, pl. 4; 1897, in 127–128; 1897, in 478–479.—Odhn., 1902, 19.—Pratt, 1902a, 889, 908 (key).

fraterna Odhn., 1902, 19–21 (in Harelda glacialis).

prussica Much., 1896, 590; 1896, 270–278, figs. 7, 15–17 (in Anas glacialis); 1898, 4, 16, 80.—Braun, 1901, 259; 1902b, 154.—Odhn., 1902, 19, 20.

CYATHOCOTYLINÆ Much., 1898b, 20, subf. of Holostomidæ, contains Cyathocotyle.—Pratt, 1902a, 889 (includes Cyathocotyle).

CYCLATELLA Ben. & Hesse, 1863; 1864a, 65, 66, 81–83 (m. annelidicola) (Tristomidæ).—Ben., 1869a, 640, is a bryozoon, see Loxosoma.—Braun, 1890a, 518 (=Loxosoma).—Mont., 1888a, 86.—Tasch., 1879, 56.

anellidicola Mont., 1888a, 88, for annelidicola.

annelidicola Ben. & Hesse, 1863; 1864a, 82–83, pl. 7, figs. 12–13 (on ?Clymene).—Mont., 1888a, 88 (anellidicola).—Prouho, 1891, 91–116 (to Loxosoma).—Sons., 1895, 119.

CYCLIDIUM Mueller, 1786.—Nitzsch, 1827, 69, contains Cerc. cyclidium [type by absolute tautonymy], C. discus.

CYCLOBOTHRIUM Cerf., 1895m, 141, 142, 144–145 (m. sessilis); 1896d, 548, 550–551.—Mont., 1903, 336 (subf. Diclidophorinæ).—St.-Remy, 1898, 552.—Zool. Anz., 1895, 327.

sessilis (Goto, 1894) Cerf., 1895m, 141, 142, 145 (in Chœrops japonicus; Japan); 1896, 548, 551.—St.-Remy, 1898, 554 (=Diclidophora sessilis).

sessile (Goto, 1894), Zool. Anz., 1895, 327.

CYCLOCIRRA Mueller, 1841, 147 (apparently m. thompsonii).

thompsonii Mueller, 1841, 147, based on Thompson, epizoon on Comatula.

CYCLOCŒLEUM Fuhrmann, 1904, 61, misprint for Cyclocœlum.

CYCLOCŒLINA Cohn, 1904, 232, misprint for Cyclocœlinæ.

CYCLOCŒLINÆ Cohn, 1904, 231, 232 (contains Typhlœcœlum=Typhlocœlum).—Stoss., 1902, 2, 3, 4, 7, 8, 9, 11, 12, 31, 34, 35.

CYCLOCŒLIUM Fuhrmann, 1904, 59, for Cyclocœlum.

mutabile (Zed., 1800) Fuhrmann, 1904, 59, 61, to (Cyclocœlium).

CYCLOCŒLUM Brand., 1892b, 507 (for Monost. mutabile, M. flavum, M. arcuatum, M. tringæ, M. ellipticum) [tld. mutabile].—Braun, 1901e, 346.—Cohn, 1904, 229, 231, 232 (in syn. of Monost. flavum).—Looss, 1899b, 659–661, 662; 1901b, 192 (type, Monost. mutabile); 1902m, 701, 702, 719, 720, 721, 729, 730, 780.—Luehe, 1901, 174 (type, Monost. mutabile); 1901, 481.—Pratt, 1902, 890, 909 (key).—Stoss., 1902, 5, 6, 7, 8, 12.

1902: Cgelocœlum Stoss., 1902, 40, misprint.

1904: Cyclocœleum Fuhrmann, 1904, 61, misprint.

1904: Cyclocœlium Fuhrmann, 1904, 59, misprint.

adolphi Stoss., 1902, 19–20, pl. 4, figs. 13, 14 (in Grus cinerea, Ardea cinerea; Siberia).

arcuatum (Brand., 1892) [Brand., 1892b, 507].—Stoss., 1902, 20–22, pl. 4, figs. 15, 16 (syn. Monost. mutabile Sieb.) (Anser dom., Bucephala clangula; Berlin).

brasilianum Stoss., 1902, 16–17, pl. 2, figs. 7, 8 (in Scolopax flaviceps; Brazil).

exile Stoss., 1902, 17–18, pl. 3, figs. 9; 10 (in Totanus ochropus).

mutabile (Zed., 1800) [Brand., 1892b, 507].—Stoss., 1902, 12, 13–14, pl. 1, figs. 1, 2 (syns. Monost. mutabile Zed., 1800; M. microstomum Crep., Cephalogonimus ovatus Stoss.) (type of genus) (in Gallinula chloropus, Fulica atra).—[Braun, 1901e, 346].—Cohn, 1904, 231, 232.—[Luehe, 1901 p, 174.]

oropunctatum Stoss., 1902, 15–16, pl. 2, figs. 5, 6 (syn. Monost. mutabile Ben.) (in Numenius arquata).

problematicum Stoss., 1902, 14–15, pl. 1, figs. 3, 4, pl. 7, fig. 25, pl. 8, fig. 29 (syn. Cyclocœlum sp. Looss, 1899b, 660, in Totanus calidris; Egypt) (in Totanus calidris, T. glottis).

robustum Stoss., 1902, 18, pl. 3, figs. 11, 12 (syn. Monost. flavum Par., v. 11 (258) (in Fuligula cristata).

CYCLOCOTYLA Otto, 1823, 300–302 (m. bellones).—Baer, 1826a, 126.—Ben. & Hesse, 1864, 47.—Blainv., 1828a, 570.—Braun, 1889a, 326.—Cobbold, 1877, 238.—Dies., 1840, 234; 1850a, 419 (syn. of Cyclocotyle).—Zæringer, 1829.

1823: Octostoma Otto, 1823, 302 (preoccupied), same as Cyclocotyla.

1823: Cyclostoma Otto, 1823, 302 (preoccupied), same as Cyclocotyla.

bellones Otto, 1823, 300, pl. 41, fig. 2, a–c (on Hornhecht=Belone acus; Naples).—Baer, — —, 687, pl. 32, fig. 9.—Blainv., 1828a, 570.—Bl., 1847, 336.—Braun, 1889a, 326.—Dies., 1850a, 419, to Cyclocotyle.—Nord., 1832a, 78, 80; 1840, 600 (to Octobothrium).

CYCLOCOTYLA—Continued.

bellones Crep., 1839, 291, for bellones.—Kroyer, 1852–53a, 1221 (in Belone rostrata Fab.).

lanceolata Zæringer, (1829), 21.—Braun, 1890a, 553 (on Salmo fario) (to Octobothrium).—Crep., 1839, 291.

CYCLOCOTYLE for Cyclocotyla.—Burm., 1837, 530.—Braun, 1890a, 515–518 (belongs to Octobothrium Leuck.).—Crep., 1838, 84.—Dies., 1850a, 289, 419 (of Otto, syn. of Octobothrium Nord.), 423 (of Schultze, syn. of Discocotyle); 1858e, 314, 372 (of Otto).—Gold., 1855a, 19.—Mont., 1888a, 83.—Tasch., 1879, 233, 239.—See Cyclocotyla.

bellones (Otto, 1823) Dies., 1850a, 419 (on Belone acus) (syns. Cyclocotyla bellones, Octobothrium bellones); 1858e, 372.—Tasch., 1879, 245 (to Octobothrium).

lanceolata Schulze in Zæringer (1829).—Crep., 1839a, 291, note 25.—Dies., 1850a, 424 (syn. of Discocotyle sagittata).—Tasch., 1879, 244 (syn. of Octobothrium sagittatum Leuck.).

CYCLOGENA Hemp. & Ehrenb., 1828a (m. Cerc. lupus; Berlin), fam. Hydatinorum.

CYCLOSTOMA Otto, 1823, 302 (as syn. of Cyclocotyla) [not Cyclostoma Lam., 1801, mollusk; Cyclostoma Nilss., 1832, fish; Cyclostoma for Ciclostoma Scacchi, 1836, mollusk].

CYMATOCARPUS Looss, 1899b, Dec., 550, 551, 593–594 (tod. undulatus), 607, 611, 633; *τό κῦμα*=wave, *ὁ καρπός*=fruit.—Braun, 1901b, 22.—Odhn., 1902, 38, 41, 42.—Pratt, 1902a, 889, 903 (key).—Staff., 1903, 828.

solearis (Braun, 1899) Braun, 1901b, 22, 23, fig. 8, or Looss, 1901l, Oct. 30, 563; 1902m, 508.

undulatus Looss, 1899b, 594, 711–712, figs. 32–34 (in Thalassochelys undulatus; Abukir, July); 1901l, 563; 1902m, 414, 508.—Braun, 1901a, 22, 23.—Heymann, 1905, 84.—Luehe, 1900, 561.

CYSTAGORA Staff., 1905, Apr. 11, 683 (m. tetracystis); *κύστις*, bladder; *ἀγορά*, assembly.

tetracystis (Gastaldi, 1854) Staff., 1905, 683 (in Rana catesbiana, R. virescens; Canada).

DACTYCOTYLE Ben. & Hesse, 1863; 1864a, 96, 110 (pollachii [type by present designation], luscæ); *δάκτυλος*, finger.—E. Ben., 1868a, 4–7; 1868, 22–36, 1 pl.—Braun, 1890a, 446.—Mont., 1888a, 8, 11, 16, 52, 59, 66, 86, 89, 99; 1903, Dec., 336 (syn. Pterocotyle) (in subf. Octocotylinæ; f. Octocotylidæ).—Par., 1894, 135 (syn. of Dactylocotyle Par. & Perugia).—Par. & Perugia, 1890, 4, 7; 1890, 10.—Tasch., 1879, 59, 73; 1879, 240.

1873: Dactylocotyle Marshall, 1873, 430.

1889: Dactyocotyle Braun, 1889a, 364, misprint.

lusca Ben., 1868a, 7 (in Morrhua lusca) (for luscæ).

luscæ Ben. & Hesse, 1864, 111–112 (in Morrhua lusca).—Ben., 1868, 36.—Braun, 1889a, 364 (on M. l.); 1890a, 535, to Octobothrium (Dactylocotyle).—Tasch., 1879, 247, to Octobothrium.

phycidis (Par. & Perugia, 1889), Par. & Perugia, 1890, 4; 1890, 7.—Braun, 1890a, 535, to Octobothrium (Dactylocotyle).

pollachi Mont., 1888, 66 (for pollachii).

pollachii Ben. & Hesse, 1863; 1864, 110–111, pl. 11, figs. 23–30 (in Merlangus pollachius).—Ben., 1868a, 7; 1868, 36, 1 pl.—Braun, 1889a, 364 (on Mer. pol.); 1890a, 535, to Octobothrium (Dactylocotyle).—Mont., 1888, 66 (pollachi).—Par. & Perugia, 1890, 4.—Scott, 1901, —, pl. 8; 1905, 117.—Tasch., 1879, 242, 246 (to Octobothrium).—Can best be taken as type of genus.

DACTYLOCEPHALA Mont., 1899, 115, 116, 117, 120, 121 (type Temnocephala madagascariensis).—Pratt, 1900, 646, 647 (Temnocephalidæ, Temnocephalinæ).

madagascariensis (Vayssière, 1892) Mont., 1899, 121 (in Astacoides madagascariensis; Madagascar).

DACTYLOCOTYLE Marschall, 1873, 430, 795, and 796, apparently for Dactycotyle. Ben. & Hesse, 1863.—Braun, 1890a, 469, 471, 477, 484, 490, 498, 516, 517, 522, 535 (syn. or subg. of Octobothrium), 546.—Cerf., 1895h, 913–946, pls. 1–2, figs. 1–20; 1895i, 831–834; 1895k, 634; 1895m, 125, 126, 137, 138, 139; 1896c, 232–233; 1896, 510–535, 536, 545, 546, 547; 1898a, 301, 302, 305–315, 322–323; 1899a, 345, 370, 383, 411.—Lint., 1905, 333, 352, fig. 151 (sp. on Brevoortia tyrannus).—Par., 1894, 135 (syn. Dactycotyle Ben. & Hesse).—Pratt, 1900a, 646 (Polystomidæ, Octocotylinæ) 652 (on gills of fish, esp. Gadidæ), 656, 660, fig. 35.—St.-Remy, 1898, 523, 545, 548.—Scott, 1901, 150.—Scudder, 1884 (1882), part 2, 91 [gives date as "1883 [1862]" and quotes Marschall, which is 1873].—Stoss., 1898, 12.

carbonarii Cerf., 1895h, 929, 931, pl. 1, figs. 1, 5, 9, 10, 11, pl. 2, figs. 12–20.

denticulatum (Olss., 1876) Cerf., 1895h, 922, 923–938, 941, 943, type of genus[a] (in Gadus carbonarius); 1896, 517, 518–530, 532–533, 534, pl. 23, figs. 1, 5, 9, 10, 11, pl. 24, figs. 12–20; 1898a, 301, 305[a], 307, 312, 313, 317, 318, 323, 325, pl. 12, figs. 6–9 (in Gadus carbonarius (Linn.)).—Lint., 1901, 408, 414 (in Pollachius virens), 474.—Par., 1899, 4.—Pratt, 1900a, 656, fig. 35, 657, 660 (key).—St.-Remy, 1898, 548–549, 550 (in Gadus virens, G. carbonarius).—Staff., 1904, May 3, 482 (gills of Pollachius vireus [virens] L.; Canada).

luscæ (Ben. & Hesse, 1863) Tasch., 1879, 247 (to Octobothrium).—Braun, 1890a, 535 (as Octobothrium (Dactylocotyle) luscæ, on Morrhua lusca.—Cerf., 1895h, 922; 1896, 517; 1898a, 302, 307, 312, 315–322, 326, pl. 12, figs. 1–5 (in Morrhua lusca); 1899a, 372.—Par., 1899, 4 (to Octobothrium) (on Gadus minutus; Portoferraio).—St.-Remy, 1898, 551.

merlangi (Kuhn, 1830) Cerf., 1895h, 922, 939, 942–943, pl. 1, figs. 4, 8 (in Gadus merlangus); 1896, 517, 531, 534, pl. 23, figs. 4, 8; 1898a, 301, 304, 310, 312, 324–325, pl. 12, figs. 12, 13 (in Gadus merlangus L.); 1899a, 370.—St.-Remy, 1898, 550, 556.

minor St.-Remy, 1898, 551=Octobothrium minus Olss., 1876.

molvæ Cerf., 1895h, [944], pl. 1, figs. 3, 7; 1896, pl. 23, figs. 3, 7.

morrhuæ (Ben. & Hesse, 1863) St.-Remy, 1898, 551 (=Pterocotyle morrhuæ).

palmatum (Leuck., 1830) Cerf., 1895h, 922, 939–940, 943—944 (in Gadus molva); 1896, 517, 531, 534–535; 1898a, 302, 312, 325–326 (in G. mol. L.); 1899a, 370.—St.-Remy, 1898, 550–551 (syn. Octodactylus inhærens Dalyell).—Scott, 1897, Apr., 127 (in the Moray Firth).

phycidis Par. & Perugia, 1889, 743–744, fig. 5 (in Phycis blennoides; Genova); 1890, 743–744, fig. 5.—Braun, 1890a, 535 to (Octobothrium (Dactylocotyle) on Phycis blenuoides [blennoides]).—Cerf., 1895h, 922; 1896, 517; 1898a, 302.—Par., 1894, 135–136 (in Phycis blennoides; Genova).—St.-Remy, 1898, 551.—Staff., 1904, May 3, 482 (gills of Phycis chuss Walb.; Canada).

pollachii (Ben. & Hesse, 1863) Braun, 1883a, 50; 1890a, 472, 476, 492, 498, 535, to Octobothrium (Dactylocotyle), on Merlangus pollachius.—Cerf., 1895h, 914–915, 921, 922, 938, 941–942, pl. 1, figs. 2, 6 (in Gadus pollachius); 1896, 211, 516, 517, 530, 533–534, pl. 23, figs. 2, 6; 1898a, 301, 311, 312, 317, 318, 319, 321, 324 (in G. p.).—St.-Remy, 1898, 549–550, 551.—Scott, 1901, 150, pl. 8, figs. 28, 29; 1901, 343 (in G. p.; Irish Sea).

squillarum (Par. & Perugia, 1889) Stoss., 1898, 12–13 (on Bopyrus squillarum; Triest).

taschenbergi Par., 1894, 704 (for taschenbergii).

taschenbergii (Par. & Perugia, 1889) Par., 1894, 136, to (Choricotyle) (in Sargus rondeletii; Genova).—Cerf., 1895h, 922, 923; 1896, 517.

DACTYLODA Mont., 1905, 25. Mai, 403 (order for Temnocephalidæ).

DACTYLODISCUS Olss., 1893, 7–8 (m. borealis).—Mont., 1903, 336 (syn. of Tetraonchus); 1905, 79–80.—Pratt, 1900a, 646, 554 (key), 657, fig. 48.—St.-Remy, 1898, 524, 564, 567.

borealis Olss., 1893, 7–8, pl. 1, figs. 7–10 (on Thymallus vulgaris, in lacubus Jemtlandiæ Sällsjön, Nälden, Ockesjön et in flumine ad Mörsil; Coregonus lavaretus, in lacu Ockesjön).—Mont., 1905, 79.—St.-Remy, 1898, 568, fig. 6 (in Coregonus lavaretus).—Pratt, 1900a, 657, fig. 48.

[a] "Dans la description, le Dactylocotyle denticulatum avait été pris comme type, parce que c'est dans cette forme que les organes de fixation, caractéristiques du genre, présentaient la plus grande complication."—Cerf., 1898, p. 305.
It is impossible to take this species as type. See International Code, Art. 30.

DACTYLOGYRUS Dies., 1850a, 290, 433, 650, 651–652 (m. auriculatus); 1858c, 374, 375; 1859c, 440.—Ben., 1858a, 1861a, 63.—Ben. & Hesse, 1864, 121.—Brand., 1894a, 309.—Braun, 1890a, 412, 413, 417, 426, 434, 438, 444, 445, 452, 458, 465, 468, 478, 479, 486, 497, 499, 503, 512, 515, 517, 523, 542, 543; 1893a, 890.—Carus, 1863, 478.—Cobbold, 1879, 41, 42.—Fraip., 1880c, 418.—Gamb., 1896a, 73.—Goldb., 1855a, 20.—Goto, 1891a, 161, 166, 183, 185; 1893a, 798, 801, fig. 3.—Haswell, 1892b, 150; 1893c, 114.—Hoyle, 1890, 539 (about 20 species, on fishes).—Jackson, 1888, 654.—Kath., 1894a, 128, 133, 144, 155, 156, 157.—Leuck., 1886d, 45, 48.—Maclaren, 1904b, 574, 598, 599, 600.—Mont., 1888a, 10, 14, 40, 84, 86, 101, 107; 1889, 114; 1891, 109, 111; 1892, Oct. 7, 186, 213 (gen. of Gyrodactylinæ); 1903, 336 (of subf. Gyrodactylinæ).—Olss., 1893, 7.—Pratt, 1900a, 646, 654 (key), 657, fig. 44.—St.-Remy, 1898, 524, 566.—Stoss., 1898, 18.—Tasch., 1879, 69; 1879, 260 (syn. of Gryodactylus Nord.), 261, 263 (of Wagener, syn. of Tetraonchus Dies.), 265 (of Wagener, syn. of Calceost. Ben.).—Wagener, 1857, 28, 29, 50, 54–55, 57–76.

æquans Wagener, 1857, 99, pl. 15, fig. 14 (in Labrax lupus); —, 84.—Ben. & Hesse, 1864, 121, 122 (to Diplectanum).—Dies., 1858c, 381 (to Diplectanum).—Tasch., 1879, 264 (to Diplectanum).

alatus Linst., 1878, 227, fig. 10 (on Blicca bjœrkna; Europe); 1889a, 91 (in Bl. bj., Alburnus lucidus).—Braun, 1890a, 544, 549, 550.

amphibothrium Wagener, 1857, 57, 58, 60, 66, 70, pl. 11, figs. 3, 4, pl. 12, figs. 1–4, pl. 15, fig. 11 (in Acerrina cernua).—Braun, 1890a, 544, 549, 550.—Dies., 1858c, 377.—Linst., 1873, 99; 1878, 229–230, fig. 15.—Tasch., 1879, 262 (in Acerina cernua).

anchoratus (Duj., 1845) Wagener, 1857, 49, 52, 55, 62, 99, pl. 15, fig. 8.—Dies., 1858c, 376.—Kath., 1894a, 156.—Reported for Carassius auratus, Cyprinus carpio.

auriculatus (Nord., 1832) Dies., 1850a, 433, 651–652; 1858c, 375–376; 1859c, 440.—Ben., 1858a, 1861a, 66 (to Gyrodactylus).—Braun, 1890a, 419, 544, 549, 550, 551.—Kath., 1894a, 156.—Kroyer, 1852–53a, 1223, 1225, 1226 (in Abramis brama L.; Phoxinus aphya L.).—Par. & Perugia, 1890, 9.—Pratt, 1900a, 657, fig. 44.—Tasch., 1879, 261 (syns. Gyrodactylus auric. Nord.; G. anchoratus Duj.) (in Abramis brama, Cyprinus carpio, Phoxinus lævis).—Wagener, 1857, 76.

benedeni St.-Remy, 1898, 566, 567 for Dactylogyrus vanbenedeni Par. & Perugia.

calceostoma Wagener, 1857, 99 (in Sciæna aquila).—Dies., 1858c, 379 (in Sc. aq.); 1859c, 441 (syn. of Calceost. elegans Ben., type of Calceostomum).—Tasch., 1879, 265 (syn. of Calceost. elegans Ben.) (of Ben.).

cochlea (Wedl, 1857) Braun, 1890a, 408, 417.

cornu Linst., 1878, 228–229, fig. 13 (on Abramis vimba).—Braun, 1890a, 544, 549, 550 (on Ab. v.; Middle Europe).

crassiusculus (Wedl, 1857) Braun, 1890a, 417, 435.

cruciatus (Wedl, 1857) Braun, 1890a, 417.

crucifer Wagener, 1857, 55, 60, 63, 73, pl. 14, fig. 3 (in Cyprinus erythrophthalmus).—Braun, 1890a, 544, 549, 551.—Dies., 1858c, 377–378.—Tasch., 1879, 262 (in Leuciscus erythrophthalmus).

difformis Wagener, 1857, 63, pl. 15, fig. 6 (in Cyprinus erythrophthalmus).—Braun, 1890a, 544, 549, 551.—Dies., 1858c, 378 (in Leuciscus erythrophthalmus).—Tasch., 1879, 262 (in L. ery.).—Also reported for Scardinius erythrophthalmus).

dujardinianus (Dies., 1850) Dies., 1858c, 376 (in Cyprinus carpio, Leuciscus rutilus); 1859c, 440 (syn. Gyrodactylus auriculatus Ben.?).—Braun, 1890a, 544, 549, 550, 551.—Kath., 1894a, 156.—Linst., 1877, 182–183.—Olss., 1893, 7.—St.-Remy, 1898, 566–567.—Tasch., 1879, 261 (syn. Gyrodac. auric. Nord. of Duj., 1845a) (in Cypr. carp., Leuc. rut., Abramis brama).—Also reported for Cypr. gibelio, Leuc. idus, L. prasinus.

echeneis Wagener, 1857, 99, pl. 15, fig. 13 (in Chrysophrys aurata).—Braun, 1890a, 544, 549 (Genua), 550.—Dies., 1858c, 379 (in Chrys. aur.).—Par. & Perugia, 1889, 746 (in Chrys. aur. Wagener); 1890, 746.—Tasch., 1879, 263 (in Chrys. aur.).

falcatus (Wedl, 1857) Dies., 1858c, 377 (in Cyprinus sp.).—Braun, 1890a, 417, 544, 549.—Tasch., 1879, 261–262 (syn. Gyrodactylus falcatus Wedl).

DACTYLOGYRUS—Continued.

fallax Wagener, 1857, 55, 70, pl. 11, figs. 1, 2, pl. 15, fig. 7 (in Cyprinus erythrophthalmus, C. rutilus).—Braun, 1890a, 544, 549, 551.—Dies., 1858e, 376–377.—Tasch., 1879, 261 (in Leuciscus rutilus, L. erythrophthalmus).—Also reported for Leuc. idus, L. prasinus, Scardinius erythrophthalmus.

forceps Leuck. (1857), 26 (in Chondrostoma nasus); 1858a, 118 (in Cyprinus nasus, C. dobula).—Linst., 1878a, 254 (in Squalius cephalus), 257 (in Chond. nasus).

gracilis Wedl, 1861, 480, pl. 3, figs. 41–42 (on Hydrocyon dentex).—Braun, 1889a, 362.

maior Tasch., 1879, 263 (in Gobio fluviatilis) (for major).

major Wagener, 1857, 99, "pl. 15, fig. 9" (in Gobius fluviatilis).—Braun, 1890a, 544, 549, 550.—Dies., 1858e, 379 (in Gobio flaviatilis).—Tasch., 1879, 263 (maior) (in Gobio fluviatilis).

malleus Linst., 1877, 182, pl. 12, figs. 12–13 (in Barbus fluviatilis).—Braun, 1890a, 544, 549, 550.—Sramek, 1901, 95, 110, fig. 64 (in Barb. fluv.).

megastoma [also megastomum] Wagener, 1857, 57, 62, 67, 99, pl. 14, fig. 5, pl. 36A, fig. 2 (in Cyprinus blicca, C. amarus).—Braun, 1890a, 544, 549, 551.—Dies., 1858e, 378 (in Rhodeus (Cyprinus) amarus).—Tasch., 1879, 262 (in Rhod. am.).

megastomum, see megastoma.

minor Wagener, 1857, 60, 63, pl. 14, fig. 4 (in Cyprinus alburnus).—Braun, 1890a, 544, 549, 550.—Dies., 1858e, 378 (in Aspius alburnus).—Linst., 1878, 227–228, fig. 11.—Tasch., 1879, 262 (in Aspius alburnus).—Also reported for Alburnus lucidus, Blicca björkna).

mollis (Wedl, 1857) Dies., 1858e, 378–379 (in Cyprinus carpio).—Braun, 1890a, 544, 549, 550.—Linst., 1885, 252, pl. 15, fig. 29.—Mont. 1888, 90.—Tasch., 1879, 262 (syn. Gyrodactylus mollis Wedl) (in Cyprinus carpio).

monenteron Wagener, 1857, 52, 55, 56, 58, 61, 63, 64, 65, 66, 67, 69, 70, 71, 72, 73, 76, pl. 13, fig. 1, pl. 36A, fig. 3f (in Esox lucius).—Braun, 1890a, 424, 452, 486.—Dies., 1858e, 380 (to Tetraonchus).—Olss., 1893, 7.

paradoxus (Crep., 1839a) Linst., 1878a, 210 (in Lucioperca sandra).

pedatus Wagener, 1857, 99, pl. 15, fig. 12, pl. 36A, fig. 3 (in Julis).—Ben. & Hesse, 1864, 121.—Dies., 1858e, 382 (to Diplectanum).—Tasch., 1879, 264 (to Diplec.).

siluri Wagener, 1857, see Braun, 1890a, 544, 549, 552 (in Silurus glanis; middle Europe).

siluri glanidis Wagener, 1857, see Dies., 1858e, 379 (in Silurus glanis).

species Olsson (in Coregonus lavaretus).

species Sramek, 1901, 95 (in Blicca björkna L.).

species Sramek, 1901, 95 (in Carassius vulgaris L.).

species Sramek, 1901, 95 (in Idus melanotus L.).

species Sramek, 1901, 96 (in Scardinius erythrophthalmus Bonap.).

sphyra Braun, 1890a, 544, 549, 550, for sphyrna.

sphyrna Linst., 1878, 229, fig. 14 (in Abramis vimba).—Braun, 1890a, 544 (sphyra), 549 (middle Europe), 550.

tenuis (Wedl, 1857) Dies., 1858e, 379 (in Perca fluviatilis).—Braun, 1890a, 417, 544, 549, 551.—Tasch., 1879, 262–263 (syn. Gyrodactylus tenuis Wedl) (in Perca fluviatilis).

trigonostoma Wagener, 1857, 99, "pl. 15, fig. 10" (in Cyprinus rutilus).—Braun, 1890a, 544, 549, 551.—Dies., 1858e, 379 (in Leuciscus rutilus).—Tasch., 1879, 263 (in Silurus glanis).—Also reported for Leuc. idus, L. prasinus.

tuba Linst., 1878, 228, fig. 12 (in Squalius leuciscus).

uncinatus Wagener, 1857, pl. 13, fig. 2 (in Perca fluviatilis).

unguiculatus Wagener, 1857, 61, 62, 64, 65.—Dies., 1858e, 381 (to Tetraonchus).—Tasch., 1879, 263 (to Tetraonchus).

van benedeni St.-Remy, 1898, 567 (syn. of Tetraonchus benedeni), for van benedenii.

van benedenii Par. & Perugia, 1895, 2 (in Mugil auratus; Triest, Dec.), see also benedenii.

DECACOTYLUS Mayer, 1841a, 24, D. lanceolatus alosæ.

lanceolatus alosæ Mayer, 1841a, 24, Octobothrium lanceolatum renamed.

DENDROCOELI Burm.—Braun, 1890a, 515.—Mont., 1888a, 83.—Tasch., 1879, 233 (contained f. Malacobothrii for Diplost., Cerc., Dist., Amphist., Holost.,

DENDROCŒLI—Continued.
Polyst., Monost., Caryophyllæus, and f. Plectobothrii for Aspidogaster, Trist., Octobothrium, Diplozoon, Hectocotyle, Cyclocotyle, Nitzschia, Axine).

DERMOCYSTIS Staff., 1905, Apr. 11, 682 (m. ctenolabri); δέρμα, skin; κύστις bladder.

ctenolabri Staff., 1905, Apr. 11, 682 (gills and skin of Ctenolabrus adspersus Walb.) includes Linton, 1899, 281, 296, pl. 40, figs. 76–81.

DEROGENES Luehe, 1900w, 507–509 (m. ruber); 1901n, 395, 396, 476, 478–479, 480, 481, 484 (Hemiuridæ).—Looss, 1901, 206; 1901, 438; 1901, 658; 1902, 839.—Odhn., 1905, 363, 364, 365, 366.—Pratt, 1902a, 889, 905 (key).—Stoss., 1902, 582.

affinis (Rud., 1819) Luehe, 1901n, 479 (in Scorpæna cirrosa).—Odhn., 1905, 364.

cacozelus Nicoll, 1907, 72, 90–91, pl. 3, fig. 10 (in Pleuronectes limanda, Hippoglossus vulgaris).

minor Looss, 1901d, 437–439, fig. 5 (in Labrus merula; Triest).—Johnstone, 1907, 191–192.—Luehe, 1901n, 479.—Odhn., 1905, 361, 364.

plenus Staff., 1904, May 3, 484 (in Anarrhichas lupus; Canada); 1905, Apr. 11, 682.

ruber Luehe, 1900, 507–509 (in gall bladder of Trigla lineata); 1901, 396, 479, 483.—Looss, 1901, 437, 438, 439.—Odhn., 1905, 362, 363, 364.

urocotyle (Par., 1899) Odhn., 1905, 364.

varicus (Mueller, 1784) Looss, 1901d, 438, 439.—Johnstone, 1907, 188–192, fig. 18 (in G. merl.; Cumberland).—Luehe, 1901, 479.—Nicoll, 1907, 68, 70, 71, 72, 90, 91 (in Cottus bubalis, C. scorpius, Gadus merlangus, Hippoglossus vulgaris, Pleuronectes limanda, Rhombus lævis, R. maximus).—Odhn., 1905, 360–364, 365, pl. 4, figs. 6–7 (syns. Fasc. varica Mueller, Dist. dimidiatum.—Staff., 1904, May 3, 483 (in Salmo salar, Gadus callarias, Melanogrammus æglefinus, Pollachius virens, Clupea harengus, Osmerus mordax, Sebastes marinus, Anguilla anguilla, Cryptacanthodes maculatus, Acanthocottus scorpius, Hemitripterus americanus, Lophius piscatorius, Hippoglossus hippoglossus, Limanda ferruginea, Platysomatichthys hippoglossoides, Hippoglossoides platessoides; Canada), 484; 1905, Apr. 11, 682 (abundant in copepods, Acartia, Aug.).

DEROPRISTIS Odhn., 1902, 154–156 (tod. hispida).—Pratt, 1902a, 888, 896 (key).

hispida (Abildg., 1819) Odhn., 1902, 155, 156, 159.—Staff., 1904, May 3, 492 (hispidus, int. Acipenser rubicundus), 493.

inflata (Mol., 1859) Odhn., 1902, 157–160, figs. 1–2 (in Anguilla vulgaris; Triest).—Staf., 1904, May 3, 485 (int. A. anguilla; Canada).

DEUTEROBARIDINÆ Looss, 1902m, 699.

DEUTEROBARIS Looss, 1900, Dec. 3, 602=Baris Looss, 1899 [not Germ., 1817] renamed, hence type proteus; 1902, 546, 634, 635, 639, 646, 647, 648, 659, 660, 664, 669, 674, 675, 682, 684, 693–694, 695, 698, 699.—Pratt, 1902, 890, 909 (key).

proteus (Brandes, 1891) Looss, 1902, 416, 633, 694, pl. 31, figs. 151–168 (in first, widened, portion of large intestine of Chelone mydas).

DIAPHOROCOTYLINÆ Mont., 1903, 336 (f. Octocotylidæ).

DICLIBOTHRIUM Leuck., 1836a, 764, see Diclybothrium.

DICLIDOPHORA Dies., 1850a, 289, 417–418 (longicollis and palmata), 425; 1858c, 315, 383–384.—Braun, 1890a, 518.—Burm., 1856a, 251.—Cerf., 1895h, 920; 1895m, 130, 134, 137, 139, 140, 141, 142–143; 1896, 516, 540, 542, 545, 546, 547, 548, 549 550.—Gamb., 1896a, 73.—Goldb., 1855a, 19.—Johnston, 1865a, 31.—Mont., 1903, 336 (syn. Choricotyle) (subf. Diclidophorinæ).—Pratt, 1900a, 646, 652 (key), 656, 660, fig. 36.—St.-Remy, 1898, 523, 545, 551–552.—Tasch., 1879, 239.

affinis (Lint., 1898) Lint., 1901, 408, 414, 482 (in Paralichthys dentatus).—Pratt, 1900a, 656, fig. 36, 657, 660 (key).

chrysophri St.-Remy, 1898, 555, for chrysophryi.

chrysophryi (Ben. & Hesse, 1863) —— ——, 1895.

elongata Goto, 1894a, 210–212 (in Pagrus tumifrons, sometimes on Cymothoa; Mogi and Hakodate, Japan).—Cerf., 1895m, 126, 142, 144 (in Pag. tum.; Japan); 1896, 536, 547, 548, 550; 1898a, 303.—St.-Remy, 1898, 553.

DICLIDOPHORA—Continued.

labracis Cerf., 1895m, 126–142, 143, pl. 3, figs. 1–15 (in Labrax lupus; White Bank, N. Sea); 1896, 535–537, 539, 540, 548, 550, pl. 25; 1896, 230–232; 1898b, 338; 1899a, 371, 412.—Ben., 1895, 20–21.—Braun, 1896a, 1346.—St.-Remy, 1898, 554–555.

longicollis Dies., 1850a, 417 (Octost. merlangi Kuhn, 1830, renamed) (in Merlangus communis); 1858e, 384; 1859c, 443 (to Octoplectanum).—Ben., 1858a, 1861a, 44, 49 (syn. of Octobothrium merlangi.—Cerf., 1895h, 915 (syn. of Octob. merl.); 1895m, 139; 1896, 512, 547.—Tasch., 1879, 245 (syn. of Octob. merl. Kuhn).

merlangi (Kuhn, 1829) Kroyer, 1838–40a, 606 (in Merlangus vulgaris L.).

palmata (Leuck., 1830) Dies., 1850a, 417–418 (includes Octobothrium digitatum Rathke); 1858e, 384; 1859c, 443 (to Octoplectanum).—Cerf., 1895f, 20–21; 1895h, 917 (to Octobothrium); 1895m, 139; 1896, 513, 547.—Johnston, 1865a, 31.—Kroyer, 1838–40a, 608, 611 (in Lota molva L., Hippoglossus maximus Mind).—Tasch., 1879, 246 (to Octobothrium).

sessilis Goto, 1894a, 212–213 (in Chœrops japonicus; Mitsugahama, Japan).—Cerf., 1895m, 126, 140 (in Ch. jap.); 1896, 536, 547.—St.-Remy, 1898, 553–554.

smaris (Ijima, 1894) Goto, 1894a, 207–210, fig. 1 (syn. Octobothrium smaris); on Smaris vulgaris, on caudal segment of a Cymothoa; Gulf of Naples).—Cerf., 1895m, 126, 140, 142, 143–144 (in Cymothoa sp. in buccal cavity of Smaris vulgaris; Gulf of Naples); 1896, 536, 547, 548, 550; 1898a, 303 (in Cymothoa on Sm. vul.).—St.-Remy, 1898, 552–553, 556.

sp. Lint., 1905, 333, 380 (in Orthopristis chrysopterus; Beaufort, N. C.).

taschenbergi Par. & Perugia, 1892, 95, pl. 2, fig. 4, pl. 3, figs. 13–14, teste St.-Remy, 1898, 555.

tetrodonis Goto, 1894a, 213–215, pl. 10, figs. 1–4 (in Tetrodon sp.; Hagi, Japan).—Cerf., 1895m, 126, 140 (in Tetrodon sp.); 1896, 536, 547.—St.-Remy, 1898, 554.

DICLIDOPHORINÆ Cerf., 1895f, 20–21; 1895m, 132, 142; 1896, 535–552; 1898a, 303; 1899a, 345, 370.—Mont., 1903, 336 (f. Octocotylidæ).—St.-Remy, 1898, 552.

DICLYBOTHRIUM F. S. Leuck., 1835a, 88 (m. armatum); 1836a, 764 (Diclibothrium).—Ben. & Hesse, 1864, 84.—Braun, 1890a, 518.—Burm., 1856a, 251.—Crep., 1839, 292.—Dies., 1850a, 289, 421, 425; 1858e, 315, 383 (armatum); 1859c, 443.—Goldb., 1855a, 19.—Tasch., 1879, 254, 255 (syn. of Diplobothrium Leuck.).

1836: Diclibothrium Leuck., 1836a, 764.

1836: Diklibothrium Leuck., in Kollar, 1836, 81.

1842: Diplobothrium Leuck., 1842a, 18 (armatum).

armatum Leuck., 1835a, 88 (in Acipenser rostratus); 1836a, 764; 1836, 219.—Braun, 1889a, 332.—Crep., 1839, 292.—Dies., 1850a, 421 (includes D. crassicaudatum Leuck., Hexacotyle elegans Nord., Diplobothrium armatum Leuck., Polyst. armatum Duj.); 1858e, 383.—Staff., 1904, May 3, 488 (to Diplobothrium; on gills of Acipenser rubicundus).—Tasch., 1879, 254 (to Diplobothrium).

crassicaudatum Leuck., in Kollar, 1836, 81 (Diklibothrium) (in Acipenser stellatus).—Crep., 1839a, 292.—Dies., 1850a, 421 (syn. of Diclib. armatum).—Tasch., 1879, 254 (syn. of Diplobothrium armatum Leuck.).

DICOTYLE—Stiles, 1898a, 59 (quoted from Sonsino; a larval trematode).

DICOTYLIDÆ Mont., 1903, 336 (subf. Dicotylinæ, g. Sphyranura).

DICOTYLINÆ Mont., 1903, 336 (g. Sphyranura).

DICRANOCŒLA Dies., 1850a, 286, 288, 293 (as tribe; "Tractus intestinalis bifurcatus"), 408.—Braun, 1893a, 892.—Goldb., 1855a, 15, 17.—Mont. 1888a, 83; 1892, Oct. 7, 196.

DICRANOCŒLI Burm., 1837, 528.—Braun, 1890a, 515.—Mont., 1888a, 83.—Tasch., 1879, 233.

DICRANOCŒLIA Dies., 1850a, 408 (subtribe I of Polycotylea, tribus III).

DICRANOPHORUS Nitzsch, 1827, 68 (contains Cerc. catellina, C. lupus, C. vermicularis, C. forcipata.? C. catellus).

(DICROCELIUM) Stiles & Hass., 1894e, 413, misprint for (Dicrocœlium).

DICROCŒLIINÆ Looss, 1899b, Dec., 635; 1902, 839.—Hollack, Johanne, 1902a, 867–869 (amphitypie); 1903a, 536; 1905, July, 53–54.—Odhn., 1902, 40.—*Pratt, 1902a, 889, 904* (key), includes Dicrocœlium, Lyperosomum, Athesmia, *related genera* Eumegacetes, Anchitrema.—Ward, 1903, 863.

(DICROCŒLIUM) Duj., 1845a, 391–401 (tld. lanceolatum = lanceatum), subg. of Dist. See Dicrocœlium.

albicolle (Rud., 1819) Duj., 1845a, 387, 393 (as variety of D. (D.) attenuatum; in Falco pennatus). See Dicrocœlium.

albidum Braun, 1893c, 353.

arrectum (Duj., 1845) Stoss., 1895, 225–226, 236.

ascidia (Ben., 1873) Stoss., 1892, 21, 39, 40.

assula Duj., 1845a, 387, 398 (in Coluber natrix; Toulouse).

atomon (Rud., 1802) Stoss., 1886, 57.

attenuatum Duj., 1845a, 387, 392–393 (in Turdus merula; Rennes) [not attenuatum Rud., 1814]. See Dicrocœlium.

bacillare (Mol., 1859) Stoss., 1886, 58.—Looss, 1899b, 571 (as described by Stoss., would belong to Creadiinæ, possibly to Creadium).

boscii (Cobbold, 1859) Stoss., 1895, 226.

buski (Lankester, 1857) Rail., 1893a, 363–364, fig. 243. See Dicrocœlium.

calceolus (Mol., 1858) Stoss., 1886, 63.

chilostomum (Mehlis, 1831) Stoss., 1892, 20–21, 39, 40.

choledochum (Linst., 1883) Stoss., 1892, 161.

clathratum (Deslongchamps, 1824) Duj., 1845a, 393-394 (as var. of D. (D.) attenuatum). See Dicrocœlium.

clavigerum (Rud., 1819) Stoss., 1889, 64–65.

cœlomaticum (Giard & Billet, 1892) Rail., 1893a, 360. See Dicrocœlium.

commune (Olss., 1867) Stoss., 1886, 58.

complanatum (Rud., 1814) Duj., 1845a, 399–400 (believes it identical with D. (D.) hians.

complexum Stiles & Hass., 1894e, June, 425–426, pl. 1, figs. 1–3 (in Felis catus dom.; U. S. A.), 1894.

concavum (Crep., 1825) Stoss., 1892, 158–159, 188, 189.

conus (Crep., 1825) Stoss., 1892, 24–25, 39, 40.—Stiles & Hass., 1896a, 156 (to Opisthorchis).

crassicolle (Rud., 1809) Stoss., 1889, 63–64.

crassum (Sieb., 1836) Stoss., 1892, 156–157, 192.

cygnoides (Zed., 1800) Duj., 1845a, 396–397.—Stoss., 1898, 31 (to Pleorchis).

cylindraceum (Zed., 1800) Duj., 1845a, 386, 395–396.—E. Bl., 1847, 295 (to Brachylæmus).—Looss, 1899b, 600 (type of Haplometra).

dendriticum (Rud., 1819) ——, 1896. See Dicrocœlium.

endolobum Duj., 1845a, 386, 397 (in "Grenouilles vertes et rousses, et de la Salamandre;" Rennes).—Looss, 1899b, 589 (type of Opisthioglyphe).

ercolanii (Mont., 1893) Stoss., 1895, 223–224, 234.—Looss, 1899b, 567 (probably identical with Telorchis linstowii).

erinaceum (Poir., 1886) Stoss., 1892, 22, 37.—Looss, 1899b, 570 (probably an Astia).

eurystomum (Linst., 1877) Stoss., 1892, 159–160, 189.

felineum (Rivolta, 1884) Rail., 1893a, 361. See Dicrocœlium.

fasciatum (Rud., 1819) Stoss., 1886, 59.—Barbagallo & Drago, 1903, 410 (in Crenilabrus cœruleus, Serranus scriba; Catania).—Looss, 1899b, 571 (as described by Stoss., this belongs to Creadiinæ, possibly to Creadium).

flexuosum (Rud., 1809) Duj., 1845a, 386, 398–399.—Type of Omphalometra 1899.

furcigerum (Olss., 1868) Stoss., 1886, 58.

fuscatum (Rud., 1819) —? —, date?

fuscescens (Rud., 1819) Stoss., 1886, 59.

gelatinosum (Rud., 1819) Stoss., 1895, 226–227, 236, 237.—Looss, 1899b, 567–568.

globiporum (Rud., 1802) Stoss., 1886, 59.

gobii (Stoss., 1883) Stoss., 1886, 58; 1892.

heterostomum (Rud., 1809) Duj., 1845a, 400 (thinks it identical with hians).—Braun, 1899, 1 (to Dicrocœlium); 1899, 487 (to Clinost.). See Dicrocœlium.

hians (Rud., 1809) Duj., 1845a, 399.—Looss, 1899b, 563 (type of Cathæmasia).

horridum (Leidy, 1850) Stoss., 1895, 220, 234. See Plagiorchis.

(DICROCŒLIUM)—Continued.

labracis Duj., 1845a, 386, 398 (in Labrax lupus; Rennes).—Ben., 1870, 45 (to Echinost.). See Dicrocœlium.

labri (Stoss., 1886) Stoss., 1886, 60.

lancea (Dies., 1850) Stoss., 1892, 26–27, 37.

lanceolatum (Rud., 1803) Duj., 1845a, 386, 391–392 [not Schrank, 1790]. See Dicrocœlium lanceatum.

lingua (Crep., 1825) Stoss., 1892, 158, 190.—Looss, 1899b, 586 (type of Tocotrema).

linstowi (Stoss., 1890) Stoss., 1895, 224–225, 237.—Looss, 1899b, 566 (to Telorchis).

longissimum (Linst., 1883) Stoss., 1892, 161, 191.—Stiles & Hass., 1896c, 155 (to Opisthorchis).

longissimum (Poir., 1886) Stoss., 1892, 25–26, 37.

lucipetum (Rud., 1819) Duj., 1845a, 386, 400–401.—Looss, 1899b, 587 (to Philophthalmus).

macrourum (Rud., 1819) Baird, 1853a, 50.—Par., 1899 (to Dicrocœlium); 1902, 4 (in Sturnus vulgaris, Turdus musicus; Elba). See Dicrocœlium.

mutabile (Mol., 1895) Stoss., 1895, 224, 236. See Dicrocœlium.

naia (Rud., 1819) Duj., 1845a, 387, for naja.

naja (Rud., 1819) Duj., 1845a, 395.—Looss, 1899b, 604 (type of Macrodera).

neglectum (Linst., 1887) Stoss., 1889, 65.—Looss, 1899b, 617 (= Pleurogenes claviger).

nigrovenosum (Bellingham, 1844) Stoss., 1895, 222–223, 234.—Luehe, 1899, 535 (thinks D. nigrovenosum belongs to Lecithodendrium).

ovatum (Rud., 1803) Duj., 1845a, 388, 394–395.—Stoss., 1892, 144 (to Cephalogonimus).—Type of Prosthogonimus 1899 and Prymnoprion 1899.

pallasii (Poir., 1885) Stoss., 1892, 27, 37.

pallens (Rud., 1819) Stoss., 1886, 59.

pellucidum (Linst., 1873) Stoss., 1892, 157,192.—Looss, 1899b, 629 (to Prymnoprion).

poirieri Stoss., 1895, 227, 237.—Looss, 1899b (to Telorchis).

pulchellum (Rud., 1819) Barbagallo & Drago, 1903, 410 (in Gobius jozo; Catania).

rathouisi (Poir., 1887) Stoss., 1892, 27–28, 40.

reflexum (Crep., 1825) Stoss., 1886, 57.

retusum (Duj., 1845) Stoss., 1886, 63.

sauromates (Poir., 1886) Stoss., 1895, 220–221, 235.

scorpænæ (Rud., 1819) Stoss., 1886, 59.—Par., 1899, 5 (to Dicrocœlium). See Dicrocœlium.

simplex (Rud., 1809) Stoss., 1886, 58.

singulare (Mol., 1861) Stoss., 1892, 162, 191.—Looss, 1899b, 596 (type of Stomylus).

spatula Duj., 1845a, 386, 394 (in Accentor modularis; Rennes).

spinosum (Linst., 1880) Stoss., 1892, 162, 193.—Luehe, 1899, 531 (perhaps syn. with Dist. cirratum).

squamula (Rud., 1819) Stoss., 1892, 20, 39.—Type of Eurysoma.

verrucosum (Mol., 1859) Stoss., 1900, 59. Homonym.

vitellilobum (Olss., 1876) Stoss., 1889, 67.—Looss, 1899b, 606–607.

viverrini (Poir., 1886) Stoss., 1892, 24, 39.—Stiles & Hass., 1896, 155 (to Opisthorchis).

DICROCŒLIUM (Duj., 1845) E. Bl., 1847, 291 (tld. lanceatum).—R. Bl., 1891, 609, 610; 1895, 730.—Braun, 1892a, 643; 1893a, 885, 909, 910; 1893, 353, 354; 1893f, 388; 1901a, 34; 1901, 562, 563, 565; 1901h, Nov. (n. sp. in Zibethkatze), 700, 701, 702; 1902, 17 June, 356; 1902b, 97, 100, 102; 1903, 166; 1906, 173 174.—Cohn, 1903, 37.—Darr, 1902, 698.—Gomy, 1897a, 374.—Hausmann, 1897b, 29.—Hollack, 1902a, 867–869.—Hoyle, 1890, 540.—Klein, 1905, 20; 1905, 78.—Leuck., 1863a, 586.—Looss, 1899b, 535, 610, 632–635, 648, 650, 721—Luehe, 1899, 530, 533; 1900, 490; 1901, 173.—Mont., 1888a, 92, 105; 1893, 150; 1896, 168.—Pratt, 1902a, 889, 904 (key).—Rail., 1900, 212; 1900, 239–242 (of birds); 1900, 514.—Rail. & Marotel, 1898, 33, 37, 38.—Sons., 1889, 276.—Stiles, 1898a, 22, 55; 1901, 193, 197.—Stiles & Hass., 1898a, 87 (lanceatum designated type), 97.—Stoss., 1892, 20; 1898, 41.—Ward, 1903, 871.

DICROCŒLIUM—Continued.

albicolle (Rud., 1819) Braun, 1901, 562; 1902b, 99–101, fig. 58 (includes macrourum Stoss., 1892, longicauda p. p. Muehling, 1890), in Aquila pennata; Vienna.

attenuatum (Duj., 1845) Rail., 1900, 241 (in Turdus merula).

buski R.Bl., 1888a, 622, for buskii.—Stiles, 1904i, 41.—Ward, 1895, 328 (in Homo).

buskii (Lankester, 1857) Weinland, 1858, 87; 1859, 281.—Cobbold, 1866, 6; 1876, 303; 1879, 20.—Stiles, 1904i.

clathratum (Deslongchamps, 1824) Looss, 1899b, 634.—Braun, 1902b, 100, 101.—Rail., 1900, 239.

cœlomaticum (Giard & Billet, 1892) Rail., 1896, 160.—Gomy, 1897a, 374, 375.

concinnum Braun, 1901, 700–702, 1 fig. (in Viverra zibetha).—Hollack, 1902a, 869.

deflectens (Rud., 1819), 1901h, 702; Braun, [1901, 563]; 1902b, 101–102, fig. 59 (in Thryothorus hypoxanthus; Brazil).

delectans Braun, 1901g, 945–946 (in Myiothera ruficeps; Brazil); 1901h, 702; 1902b, 102–103, fig. 60.

dendriticum (Rud., 1819) Looss, 1899b, 634.—Braun, 1901h, 702.

felineum (Rivolta, 1884) Moniez, 1896, 136.—Type of Opisthorchis.

heterophyes (Sieb., 1852) Weinl., 1858, 86; 1859, 281.—R. Bl., 1888a, 625.—Cobbold, 1866, 6.—Ward, 1895, 328.—Type of Heterophyes.

heterostomum (Rud., 1809) Braun, 1899, 1; 1900h, 19, 30.

hospes Looss, 1907, Mar. 5, 478–479, fig. 1 (in cattle from Soudan, in Cairo, Egypt).

illiciens Braun, 1901g, 944–945 (in Rhamphastus sp., Pipra rupricola; Brazil); 1901h, 702; 1902b, 102, 103, 104, 105–106, fig. 6.

labracis (Duj., 1845) Par., 1899, 5; 1902, 4 (syn. D. verrucosum Mol.) (in Labrax lupus; Elba).

lanceatum Stiles & Hass., 1896c, 158 (lanceolata Rud., 1803, not Schrank, 1790, renamed); 1898a, 87, 97 (type).—R. Bl., 1900, 488; 1901b, 204, 207, 209, 210; 1901c, 581 (in sheep), 584, 586, 587.—Bossuat, 1902, 188, 189.—Braun, 1901h, 702; 1903, 166–168, figs. 115–117; 1906, 174–176, figs. 106–108 (in Limax, Arion, sheep, ox, goat, ass, horse, deer, hare rabbit, pig, man; Egypt, Siberia, Turkestan, North and South America).—Gomy, 1897a, 374.—Hollack, 1902a, 868.—Kamensky, 1902, 57–62 (in dogs).—Looss, 1899b, 633, 634, 635; 1905, 88 (rare in man); 1907, Feb. 1, 125, 126, 132, 134; 1907, Mar. 5, 479.—Rail., 1899, 345.—Rail. & Marotel, 1898, 33, 38.—Stiles, 1898a, 23, 55, 56, 137, 138, 139, 140, 141, 142, 143, figs. 36, 38; 1901, 193; 1902, 25, 28, 29, 33, 34; 1902, 204; 1903, 8, 84; 1904, Aug., 9, 12, 13, 29, 30, figs. 39–41.—Stoss., 1901, 97 (in Lepus timidus; Triest).—Ward, 1903, 407; 1903, 864, 866, 869, 871 (description).

lanceolatum (Rud., 1803) Weinl., 1858, 86; 1859, 280.—R. Bl., 1888a, 602, 626; 1895, 734.—Braun, 1903, 166.—Engler, 1904, 186.—Galli-Valerio, 1898c, 7, 8; 1901c, 364 (mouton, cheval).—Kamensky, 1902a, 57–62 (in dog), 63–64.—Luehe, 1901, 172, 173; 1901, 487.—Stiles, 1898a, 55.

lobatum Rail., 1900, 241–242 (in Accipiter nisus).—Braun, 1901, 565; 1902b, 109, 110, 111 (to Lyperosomum).

longicauda (Rud., 1809) Looss, 1899, 634.—Braun, 1902b, 106, 107 (to Lyperosomum).—Rail., 1900, 240, 241.

lubens Braun, 1901g, 945 (in Pipra rupricola); 1901h, 702; 1902b, 102, 103, fig. 63 (Pipra rupricola).

macrourum (Rud., 1819) Par., 1899, 4.

mutabile (Mol., 1859) Braun, 1901, 702.

oculi humani (Gescheidt, 1833) Weinland, 1858, 86; 1859, 281.—R. Bl., 1888a, 630.—Stiles, 1902s, 29, 34.—Ward, 1895, 328 (in Homo).

olssoni Rail., 1900, 239 (Apus apus) "Dist. clathratum [Deslongchamps] of Olss. et Mueh.," renamed.—Braun, 1902b, 109.

pancreaticum (Rail., 1890) Rail., 1897, 371–377, 1 fig.—Braun, 1901h, 702.—Gomy, 1897a.—Looss, 1899b, 634; 1907, Feb. 1, 128, 132 (of Rail. & Marotel, 1898, syn. of Eurytrema cœlomaticum).—Stiles, 1898a, 23, 55, 56, 57, 140, fig. 40.

panduriforme Rail., 1900, 240–241 (in Pica pica).—Braun, 1902b, 109.

DICROCŒLIUM—Continued.

petiolatum Rail., 1900, 241 (in Garrulus glandarius).—Braun, 1901, 946; 1901h, 702; 1902b, 98, 99, 109, fig. 57.

plesiostomum (Linst., 1883) Looss, 1899b, 634.

refertum (Much., 1898) Looss, 1899b, 634.

reficiens Braun, 1901g, 945 (in Falco nitidus); 1901h, 702; 1902b, 98, 103, fig. 62.

scorpænæ (Rud., 1819) Par., 1899, 5; 1902, 5 (in Scorpæna scrofa; Elba).

sinense (Cobbold, 1875) Moniez, 1896, 125.

strigosum Looss, 1899b, Dec., 634, 635, 727–728, fig. 47 (in Merops apiaster L. & Gm.; Marg).—Braun, 1902b, 109.

voluptarium Braun, 1901g, 945 (in Falco sp.); 1901h, 702; 1902b, 102, 103.

DICROGASTER Looss, 1902h, 134 (tod. perpusillus) (subf. Haploporinæ).

contractus Looss, 1902h, 136, figs. 3–4 (in Mugil chelo).

perpusillus Looss, 1902h, 134, 135–136, figs. 1–2 (in Mugil chelo).

DIDYMOCISTIS Ariola, 1902, 105, for Didymocystis.

DIDYMOCYSTIS Ariola, 1902, 101–103 (tod. reniformis) fam. Didymozoonidæ.

reniformis Ariola, 1902, 101–103, 104, 107, figs. 1–3 (in Thynnus vulgaris; Naples) (includes Monost. bipartitum 2d form Wagener, 254, pl. 9, fig. 2, and Didymozoon thynni Tasch., 1879, 612).

wedli Ariola, 1902, 105–107, figs. 7–10 (in Thynnus vulgaris; Naples; Th. vul. and Th. tunnina from Gulf of Genoa) (includes Monost. bipartitum 3d form Wagener, pl. 9, figs. 5–8, and Didymozoon thynni partim Braun, Vermes IV, pl. 26, fig. 6d.).

DIDYMOSTOMA Ariola, 1902, 103–105 (evidently m. bipartitum), Didymozoonidæ.—This genus falls as syn. of Wedlia 1860.

bipartitum (Wedl, 1855) Ariola, 1902, 103–105, figs. 4–6 (includes Monost. bipartitum Wedl partim, Didymozoon thynni partim, Monost. micropterygis Richiardi) (in Thynnus vulgaris; Naples).

micropterygis (Richiardi, 1901) Ariola, 1902, 105. See also under syn. of bipartitum.

DIDYMOZOON Tasch., 1878, 716 (no sp. mentioned); 1879, 72; 1879, 605–617 (Wedlia renamed, hence type thynni = bipartitum), pl. 6, figs. 1–5; *δίδυμον, ζῶον*.—Ariola, 1902, 25 July, 99–108, figs. 1–11; 1903, 14 Aug., 533; 1905, July, 61.—Braun, 1883, 42, 57; 1891d, 424; 1892a, 569, 574, 577, 660, 696, 698, 699, 700, 704, 707, 711, 727, 734; 1893a, 878, 879, 886, 890, 894, 895, 913, 918; 1895, 126, 136.—Hoyle, 1890, 539.—Jackson, 1888, 654.—Looss, 1892a, 81; 1899b, 542.—Maclaren, 1904b, 602, 612.—Moniez, 1891, 186, 187.—Mont., 1888a, 9, 11, 15, 18, 34, 52, 53, 57, 92, 93, 106; 1892, Oct. 7, 214 (g. of Didymozoonidæ); 1892, 689, 690, 693, 713, 716; 1893, 24, 27, 137, 149, 150.—Par. & Perugia, 1893, 2, 3.—Poche, 1907, 125.—Pratt, 1902a, 890, 908 (key).—Richiardi, 1902–3, 4–5 (n. sp.).—Schneidemuehl, 1896, 295.—Stoss., 1898, 62.

auxis Tasch., 1879, 613, pl. 6, figs. 1, 3 (in Auxis rochei; Naples).—Braun, 1883, 41, 57; 1892a, 574; 1893a, 913.—Par., 1894, 169.—Par. & Perugia, 1890, 10; 1893, 2 (in A. roch.).

benedenii Mont., 1893, 137 (in Orthagoriscus).—Maclaren, 1904, 602.

exocœti Par. & Perugia, 1893, 1–4 (in Exocœtus volitans; Genova) (syn. Monost. filum Wagener not Duj.).—Par., 1902, 7 (in E. vol.).

filicolle Mont., 1893, 150.

lampridis Lœnnb., 1891, 73–75, pl. 2, fig. 9 (in Lampris guttatus; Kristiania Museum).—Braun, 1891d, 424; 1893a, 914.

micropterygis Richiardi, 1902, 4–5 (in Micropteryx dumerilii Cuv.).

pelamydis Tasch., 1879, 612, 614, 615, 616, pl. 6, figs. ii, v (in Pelamys sarda; Naples).—Braun, 1883a, 41; 1893a, 913.—Moniez, 1891, 186.—Par., 1894, 169; 1902, 7 (in P. s.).—Par. & Perugia, 1890, 10; 1893, 2 (in Pelamys sarda).

pretiosus Ariola, 1902, 107–108, fig. 11 (in Thynnus vulgaris).

scombri Tasch., 1879, 612, 615, 616, pl. 6, fig. iv (in Scomber colias; Naples).—Braun, 1892a, 734; 1893a, 913.—Mont., 1890, 427.—Par. & Perugia, 1890, 10; 1893, 2 (in Scomber scomber).—Stoss., 1890, 50; 1898, 63.

serrani Mont., 1889, 322–323, pl. 33, fig. 6 (in Serranus fimbriatus at Madeira and S. gigas at Naples).—Braun, 1893a, 914.—Par. & Perugia, 1893, 2 (in Serranus *gigas*).

species Par. & Perugia, 1890, 10.

DIDYMOZOON—Continued.

sphyrænæ Tasch., 1879, 612, 614, 615 (in Sphyræna vulgaris; Naples).—Barbagallo & Drago, 1903, 411 (in Sphyræna vulgaris; Catania).—Brand., 1891d, 18.—Braun, 1893a, 913.—Maclaren, 1904b, 608.—Mont., 1888a, 7, 17; 1892, 716.—Par., 1894, 169; 1899, 7; 1902, 7 (in S. vul.).—Par. & Perugia, 1890, 10; 1893, 2 (in Sphyræna vulgaris).

tænioides Mont., 1888a, 93 (in Orthagoriscus mola); 1893, 137.—Maclaren, 1904b, 602.—Stoss., 1900, 8, figs. 10–11 (in Or. mola; Triest).

thynni Tasch., 1879, 612, 613, 614, 615, 616 (syn. Monost. bipartitum Wedl [type of Wedlia 1860]) (in Thynnus vulgaris).—Ariola, 1902, 100, 101 (of Tasch. syn. of Didymocystis reniformis Ariola), 103 (of Braun's Vermes, figs. 6–7, syn. of Didymostoma bipartitum), 105 (of Braun's Vermes, pl. 26, fig. 6d, syn. of Didymocystis wedli Ariola.—Barbagallo & Drago, 1903, 411 (in Thynnus vulgaris; Tonnara di Sa. Panagia).—Braun, 1883, 57; 1892a, 660, 734; 1893a, 914.—Gamb., 1896a, 71.—Moniez, 1891, 186.—Par., 1894, 169.—Par. & Perugia, 1889, 746–747 (syn. Monost. bipartitum Wedl.) (in Thynnus thunnina); 1890, 746–747; 1890, 9–10; 1893, 2.—Stoss., 1898, 62–63.

DIDYMOZOONIDÆ Mont., 1888a, 17, 18, 23, 52, 93, 106; 1892, 7 Oct., 214 (f. of suborder Malacocotylea); 1892, 689; 1893, 12.—Ariola, 1902, 101.—Brand., 1892, 505.—Braun, 1893a, 887, 890, 895, 900, 913; 1895, 136.—Looss, 1899b, 541, 543, 659.—Luehe, 1901, 488.—Maclaren, 1904b, 603, 612.—Par. & Perugia, 1890, 9.—Poche, 1907, 125.—Pratt, 1902a, 890, 908 (key), includes Didymozoon, Nematobothrium.—Schneidemuehl, 1896, 295.—Stoss., 1898, 62.

DIDYMOZOONTIDÆ Gamb., 1896a, 73.

DIGENA Olsson, 1893, for Digenea.

DIGENEA Ben., 1858, see Braun, 1883, 38, 58; 1890a, 473, 486; 1892a, 567, 574, 601, 775; 1893a, 888, 891, 895, 898; 1895, 136.—Carus, 1863, 478.—Gamb., 1896a, 73.—Hahn & Lefèvre, 1884, 804.—Hoyle, 1890, 539 (includes Monostomidæ, Distomidæ, Gasterostomidæ, Holostomidæ).—Kholodk., 1899a, 149.—Knoch, 1894a, 11.—Kofoid, 1899, 183.—Looss, 1899, 543.—Odhn., 1902, 42, 43; 1905, 293–295.—Pratt, 1900a, 645, 646.—Stiles, 1898a, 27.—Ward, 1903, 865.

1893: Digena Olss., 1893, for Digenea.

DIGENEA s. strict. Leuck., see Looss, 1899b, 543.—Luehe, 1901, 488.

DIHEMISTEPHANUS Looss, 1901, 605–606, 628–629 (m. lydiæ).—Pratt, 1902a, 888, 894 (key).

lydiæ (Stoss., 1896) Looss, 1901, 605–606, 628–629.

DIKLIBOTHRIUM Leuck. in Kollar, 1836, 81.—Nord., 1840, 600, for Diclybothrium.

crassicaudatum Leuck. in Kollar, 1836, 81.—Nord., 1840, 600 (syn. of Hexacotyle elegans).

DIONCHUS Goto, 1899a, 286 (m. agassizi), 291; 1901, 351–352.—Mont., 1903, 336 (Anisocotylinæ, subf.); 1905, 70.—Pratt, 1900a, 646, 650 (key), 655, 659, fig. 18.

agassizi Goto, 1899a, 286–291, pl. 21, figs. 19–24 (in Remora brachyptera; Newport, R. I.).—Pratt, 1900a, 655, 657, fig. 18, 659 (key).

agassizii Mont., 1905, 69, for agassizi.

DIOSTOMUM Duffek, 1903, 843 (misprint for Distomum).

DIPHTEROSTOMINÆ Stoss., 1904, 198.

DIPHTEROSTOMUM Stoss., 1904, 197–198 (tod. brusinai=brusinæ).

1905: Diphtherostomum Staff., 1905, Apr. 11, 684.

brusinæ (Stoss., 1889) Staff., 1905, Apr. 11, 684.

brusinai (Looss, 1901) Stoss., 1904, 197–198.

luteum (Ben., 1870) Stoss., 1904, 197 [name not available].—Staff., 1905, Apr. 11 (syn. D. betencourti Mont.).

DIPHTHEROSTOMUM Staff., 1905, Apr. 11, 684, for Diphterostomum.

DIPLECTANINÆ Mont., 1903, 336 (f. Gyrodactylidæ); 1905, 80.

DIPLECTANUM Dies., 1858e, 315, 381–382 (æquans [probably type], pedatum).—Ben. & Hesse, 1864, 121, 122.—Braun, 1883, 48; 1890a, 412, 416, 452, 465, 469, 478, 479, 512, 517, 523, 542, 546; 1893a, 890.—Gamb., 1896a, 73.—Hoyle, 1890, 539.—Maclaren, 1904b, 574, 582, 583, 584, 589, 590, 595, 596, 597, 598, 599, 600, 601.—Mont., 1888a, 10, 14, 16, 66, 84, 86, 102; 1891, 111; 1892, Oct. 7, 213 (g. of Gyrodactylinæ); 1903, 336 (subf. Diplectaninæ); 1905,

DIPLECTANUM—Continued.
80.—Pratt, 1900a, 646, 654 (key), 657, fig. 45.—St.-Remy, 1898, 568.—Stoss., 1898, 18.—Tasch., 1879, 69; 1879, 264 (syn. Dactylogyrus Wagener).

acquans Sons., 1891, 263 (for æquans).

aculeatum Par. & Perugia, 1889, 745 (in Corvina nigra; Genova); 1890, 745; 1890, 4, 9.—Braun, 1890a, 417, 546, 549, 550.—Maclaren, 1904b, 576–577, 593, 601.—Par., 1894.

æquans (Wagener, 1857) Dies., 1858e, 381 (in Labrax lupus).—Ben. & Hesse, 1864, 121, 122–123, pl. 13, figs. 9–22 (in Lab. lup.).—Braun, 1890a, 408, 409, 417, 468, 479, 489, 514, 546, 549, 551; 1891d, 422.—Kerbert, 1881a, 572.—Maclaren, 1904b, 573, 574–602, pl. 20, figs. 1–12, pl. 21, figs. 13–16, 18, 20, 22, text figs. A. C. 1–5; 1904, 9 June, 443–444; 1905, 31 Jan., 20–21; 1905, June, 317; 1905, Dec., 703.—Mont., 1888a, 7, 8, 10, 13, 14.—Par. & Perugia, 1890, 4, 9, 11.—St.-Remy, 1898, 568.—Scott, 1905, 117, pl. 6, fig. 24 (in Lab. lup.).—Sons., 1890, 173–174 (in Umbrina cirrosa); 1891, 263 (acquans), 264 (in Umb. cirr-rhosa).—Stoss., 1885, 162; 1898, 18.—Tasch., 1879, 59; 1879, 264 (in Lab. lup.).

echeneis (Wagener, 1857) Par. & Perugia, 1889, 746 (in Sargus rondeletii; Genova); 1890, 746; 1890, 4, 9; 1895, 1.—Braun, 1890a, 417, 546, 549, 552.—Maclaren, 1904b, 576, 577–578, 601.—Par., 1894, 594.—Stoss., 1898, 18.—Also reported for Chrysophrys aurata.

pedatum (Wagener, 1857) Dies., 1858e, 382 (in Julis sp. ad branchias).—Braun, 1890a, 546, 549, 551.—Maclaren, 1904b, 574, 575, 601.—Par. & Perugia, 1890, 9.—Tasch., 1879, 264 (in Julis sp.).

sciænæ Ben. & Hesse, 1863; 1864, 123–124, pl. 13, figs. 23–31 (in Sciæna aquila).—Braun, 1890a, 417, 546, 549, 552.—Maclaren, 1904b, 575, 601.—Mont., 1888a, 7, 4.—Pratt, 1900a, 657, fig. 45.—Sons., 1891, 263–264 (in Sci. umbra).—Tasch., 1879, 264 (in Sci. aq.).

sciœnæ Ben. & Hesse, 1864, 123, misprint.

DIPLOBOTHRINÆ Mont., 1903, 336 (f. Hexacotylidæ); 1905, 78.

DIPLOBOTHRIUM Leuck., 1842, 13 Diclibothrium renamed, hence (type by inclusion armatum) [not Diplobothrium Beneden, 1889, cestode].—Braun, 1889a, 338 (=Diclibothrium); 1890a, 413, 415, 511, 516, 517, 518, 523, 538, 539, 546; 1893a, 890.—Dies., 1850a, 421 (syn. of Diclibothrium).—Hoyle, 1890, 539 ("one species from the gills of a sturgeon").—Mont., 1888a, 8, 11, 13, 89, 100; 1892, Oct. 7, 213 (g. of Polystominæ); 1903, 336 (subf. Diplobothrinæ); 1905, 77, 78.—Pratt, 1900a, 646, 651 (key), 656, fig. 25.—Tasch., 1879, 69; 1879, 254 (syns. Diclibothrium Leuck., Hexacotyle Nord., Polyst. Duj.).

[*affine* Lœnnberg, 1892, cestode.]

armatum (Leuck., 1835) Leuck., 1842, 13–18, pl. 1, figs. 6a–f.—Braun, 1890a, 414, 419, 539, 548, 550.—Dies., 1850a, 421 (to Diclibothrium).—Pratt, 1900a, 656, 657, fig. 25.—Staff., 1904, 3 May, 488 (on gills of Accipenser rubicundus; Canada).—Tasch., 1879, 254–255 (syns. Diclibothrium crassicaudatum Leuck., D. armatum Leuck., Hexacotyle elegans Nord., Polyst. armatum Duj.).—Reported also for Accipenser stellatus.

[*simile* Ben., 1889, cestode.]

DIPLOCOTYLE Dies., 1850a, 286, 301 (m. mutabile); syn. Diplodiscus [not Diplocotyle Krabbe, 1874, cestode]: 1855a, 378, 381, 393, 394; 1858d, 272.—Ariola, 1901, 412.—Burm., 1856a, 250.—Fil., 1854a, 6.—Goldb., 1855, 16.—Moul., 1856a, 121, 123.

[*cohærens* Linst., 1903, cestode.]

mutabile Dies., 1850a, 301 (in Planorbis nitidus; Ticini) (Diplodiscus diesingi Fil., renamed); 1855a, 394; 1858d, 241, 242, 272–273 (mutabilis) (syns. Diplodiscus diesingii, Cerc. diplocotylea Pag.) (larva of Diplodiscus subclavatus) (in Planorbis marginatus, P. nitidus, P. vortex; Heidelberg, Ticini, Moncalier).—Ben., 1858a, 1861a, 82 (syn. of Amphist. subclavatus).—Linst., 1873, 1 (larva of Diplodiscus subclavatus Dies.) (mutabilis).—Moul., 1856a, 107 (=Diplodiscus diesingii), 208 (syn. of Cerc. amphistomi subclavati).

mutabilis Dies., 1855a, 394 (for mutabile).

[*olrikii* Krabbe, 1874b, 22, cestode.]

[*rudolphii* (Mont., 1890) Mont., 1890, cestode.]

[*serrata* Linst., 1901, cestode.]

DIPLODISCINÆ Cohn, 1904, 242.

DIPLODISCUS Dies., 1836d, 237, 238, 253–255 [type subclavatus]; 1850a, 287, 301 (of Fil., syn. of Diplocotyle), 318–319 (syns. Planaria, Fasc., Dist., Hirudo, Amphist.); 1855a, 380, 384, 393 (cf. Diplocotyle); 1858c, 312, 359; 1859c, 435–436 (mentions only subclavatus, but reference is not necessarily designation of type).—Brand., 1888a, 12.—Braun, 1892a, 613, 650, 663, 664, 665, 698, 712, 715, 814; 1893a, 817, 820, 823, 827, 872, 884, 886, 890, 894, 895, 904, 906, 918; 1895, 136.—Cobbold, 1872b, 91 (subg. of Amphist.).—Cohn, 1904, 242.—Crep., 1839a, 286.—Fil., 1837a, 334 (mentions only diesingi); 1855b, 24.—Fischder., 1902a, 6; 1903h, 487, 489.—Gamb., 1896a, 73.—Goldb., 1855a, 17.—Looss, 1902m, 440, 442.—Mont., 1888a, 7, 12, 35, 84, 91, 103; 1892, Oct. 7, 214 (g. of Amphistominæ).—Moul., 1856a, 16, 121.—Nord., 1840, 629.—Piana & Stazzi, 1900, 523.—Poir., 1883, 79.—Pratt, 1902a, 887, 893 (key).—Schneidemuehl, 1896, 295 (Diplodiskus).—Sieb., 1854, 19, 20.—Sons., 1895, 185, 186.—Wagener, 1857, 27, 39, 45, pl. 16, fig. 4, pl. 17, fig. 2, pl. 18, figs. 1–4, pl. 19, figs. 1–4.

1850: Diplocotyle Dies., 1850a, 286, 301 (m. mutabile=subclavatum) [not Krabbe, 1874, cestode].

1896: Diplodiskus Schneidemuehl, 1896, 295 (for Diplodiscus).

conicum Polonio, 1859; 1860; see Par., 1894, 140 (in Natrix torquata; Padova). [See also Dist. conicum Polonio.]

diesingi Fil., 1837a, 334–336, figs. 1–5, 337 (in Planorbis nitidus; Ticino).—Dies., 1850a, 301 (syn. of Diplocotyle mutabile; type of Diplocotyle).

diesingii Fil., 1854a, 6, pl. 1, figs. 1–4 [type of Diplocotyle] (in Planorbis nitidus) for diesingi; 1855b, 14, 20, 22, 23.—Ben., 1858a, 1861a, 81, 82 (syn. of Amphist. subclavatum).—Dies., 1855a, 394 (syn. of Diplocotyle mutabilis); 1858d, 272 (syn. of Diplocotyle mut.).—Levin., 1881a, 63.—Moul., 1856a, 95 (to Cerc.) (syn. Redia gracilis Fil.), 106, 107, 208, 209 (syn. of Cerc. amphistomi subclavati).—Villot, 1878, 36 (syn. of Cerc. diplocotylea Dies.).

mutabilis (Dies., 1850) Par., 1894, 140 to (Diplocotyle) (in Planorbis nitidus; Pavia).

subclavatus (Pallas, 1760) Dies., 1836d, 238, 240, 253–254, pl. 24, figs. 19–24 (in Hyla arborea, Rana temporaria, R. esculenta, Bufo cinereus, B. igneus, Leptodactylus sibilatrix); 1850a, 318–319 (includes Hirudo tuba Braun); 1858c, 359–360 (in Dendrohyas viridis, Pelophylax esculentus, Rana temporaria, R. pipiens, Phryne vulgaris, Bufo viridis, Bombinator igneus, Leptodactylus sibilatrix, Lissotriton punctatus); 1859c, 435–436 (includes Amphist. subclavatum Ben., 1858, 81, Cerc. amphistomi subclavati Ben., 1858, 82, in Cyclas cornea, etc.).—Ben., 1858a, 1861a, 82 (to Amphist.).—Bettend., 1897a, 4, 37 (of Gœze); 1897, 308.—Blochmann & Bettend., 1895a, 217, fig. 3.—Braun, 1892a, 598, 613, 620, 641, 650, 693, 698, 711, 759, 760, 766, 768, 776, 779, 783, 785, 798, 804, 806, 807, 809, 812, 813, 814; 1893a, 817, 818, 823, 824, 828, 830, 831, 906.—Cobbold, 1872b, 92; 1879, 51.—Cohn, 1903, 39; 1904, 240, 241, 242.—Crep., 1839a, 286, 287.—Darr, 1902, 679.—Fil., 1837a, 338 (to Amphist.); 1854; 1855.—Fischder., 1903h, 488.—Gamb., 1896a, 71.—Giebel, 1857, 266.—Kowal., 1894, 2.—Lang, 1892a, 81 (to Amphist.).—Linst., 1873, 1 (larva=Diplocotyle mutabilis Dies.); 1877, 13–14.—MacCallum, 1905, 669.—Mol., 1859, 27.—Much., 1898, 20.—Nord., 1840, 627 (to Amphist.), 629.—Par., 1894, 140 to (Amphist.) (in Rana esculenta; Padova).—Polonio, 1859.—Sieb., 1837, 263.—Sons., 1895, 180, 185.—Ssinitzin, 1905, 157–158; 1906, 685.—Stoss., 1890, 51.—Wagener, 1857, 26, 100, pl. 16, fig. 4, pl. 17, fig. 1.

subclavatus Dies., of Leidy, 1856b, 45 (in Rana pipiens); 1904a, 88.—Staff., 1905, 689–690 (syn. of Diplodiscus temperatus n. sp.).

temperatus Staff., 1905, 689 (in Rana catesbiana, R. virescens; Canada), includes subclavatus Dies. of Leidy, 1856.

unguiculatus (Rud., 1819) Dies., 1836d, 238, 254–255, pl. 24, figs. 25–27 (in Salamandra palustris); 1850a, 319.—Baird, 1853a, 44 (=Amphist. subclavatum Rud).—Braun, 1892a, 613.—Crep., 1839, 287.—Fischder., 1903h, 488.—Nord., 1840, 629 (in Triton lacustris).

DIPLODISKUS Schneidemuehl, 1896, 295, for Diplodiscus.

DIPLOOZON Mont., 1888a, 64, for Diplozoon.

DIPLOOZOON Mont., 1888a, 64, for Diplozoon.

DIPLOSTOMA Cobbold, 1860a, 49, for Diplostomum.

DIPLOSTOMATUM Olss., 1893, 8, see Diplostoma.

DIPLOSTOMEA Olss., 1893, 8, f. name for Diplostomeæ.

DIPLOSTOMEÆ Mont., 1888a, 6, 7, 11, 12, 14, 15, 18, 26, 28, 33, 34, 41, 46, 47, 51, 52, 53, 54, 56, 57, 60, 64, 67, 90, 91, 92, 94, 102, 103, 108; 1891, 110.—Brand., 1888a, 49; 1890a, 576, 580.—Braun, 1893a, 886, 887.

DIPLOSTOMIDÆ Poir., 1886, v. 4 (3), 327–346, pls. 18–20; (1887) v. 1 (14), 425–426.—Brand., 1888a, 17, 49, 53; 1890a, 575.—Braun, 1893a, 886, 887.—Mont., 1888a, 10, 15, 22, 53, 91, 103.

DIPLOSTOMINÆ Brand.—Braun, 1893a, 890, 895, 901.—Mont., 1892, Oct. 7, 214 (subf. of Holostomidæ).—Pratt, 1902a, 890, 908 (key) (includes Diplost., Polycotyle).

DIPLOSTOMULUM Brand., 1892b, 511, as collective group, not as genus, hence no type.

constrictum (Dies., 1850) Brand., 1892b, 511.

DIPLOSTOMUM Nord., 1832a, 27–28, 34, 39, 47, 69 (type of first group Dip. volvens; type of second group Dip. clavatum; type by elimination and page precedence volvens) [not Diplostoma Rafinesque 1817, mammal]; 1840, 561, 602, 617, 629 630. Brand., 1888a, 11, 12, 17, 18, 49, 50 (proposed as new genus; not of Nord.), 52, 54–58; 1890a, 575, 576, 578, 580.—Braun, 1883, 40, 56; 1890a, 515; 1892a, 600, 658, 715, 774, 792, 793, 794; 1893a, 872, 879, 881, 884, 886, 887, 890, 892, 895, 900, 901, 917; 1893b, 187; 1894, 166; 1895, 132, 136.—Burm., 1837a, 529; 1856a, 250.—Cobbold, 1860a, 49 (Diplostoma).—Crep., 1839a, 289. Dies., 1850a, 287, 304 (syn. of Tylodelphys), 305–307; 1855, 60; 1858e, 312, 317–318 (volvens, cuticola, grande); 1859c, 424.—Duj., 1845a, 473–474.—Fischer, 1840a, 156.—Gamb., 1896a, 64, 73.—Goldb., 1855a, 17.—Heider, 1900, 21.—Henle, 1835a, 587.—Hoyle, 1890, 539.—Jackson, 1888, 652, 653, 654. Leuck., 1863a, 475, 525.—Mol., 1858, 287; 1861, 191.—Mont., 1888a, 15, 54, 57, 61, 71 (Displost.), 83, 84, 91 (Diplostostomum), 104; 1892, Oct. 7, 214 (g. of Diplostominæ).—Moul., 1856, 12, 16 (probably young holostomes).—Pavesi, 1881, 615.—Poir., 1886, 327–346.—Pratt, 1902a, 890, 908 (key).—Schneidemuehl, 1896, 295.—Tasch., 1879, 233.—Villot, 1898, 541, 542.—Wyman, 1869, 42.—Wolf, 1903, 605.

1860: Diplostoma Cobbold, 1860a, 49–51, for Diplostomum.

1888: Diplostostomum Mont., 1888a, 91, misprint.

1888: Displostomum Mont., 1888a, 71, misprint.

abbreviatum Brand., 1888a, 55 (in Crocodilus sp.; Brazil); 1890a, 581–582, pl. 39, figs. 15–17 (in Croc. sp.; Brazil).—Braun, 1893a, 901.

ægyptiaca Cobbold, 1876t, 757.—Fischder., 1903h, 488.—Sons., 1895, 179.

ægyptiacum Cobbold, 1876t, 757 (in Equus; Egypt); 1877, 233, 235, 238.—Fischder., 1902a, 46 (syn. of Gastrodiscus polymastos Leuck.).—Lejtenyi, 1881a, 1.—Looss, 1896b, 13 (to Gastrodiscus).—Sons., 1895, 179.—Ward, 1895, 338 (in Equus caballus).—Zuern, 1882, 222.

alatum (Gœze, 1782) Par., 1894, 140 (as Dip. (Hemist.) alatum Dies.) (in Vulpes vulgaris, Padova; Canis familiaris, Torino).

auriflavum Mol., 1859, 287 (in Ardea nycticorax; Batavii); 1861, 191–192, pl. 1, figs. 1–2.—Braun, 1893a, 901.—Dies., 1859c, 424.

bifurcatum (Wedl, 1861) Brand., 1888a, 57–58 (in Crocodilus vulgaris; Egypt); 1890a, 584.—Braun, 1893a, 901.—Odhn., 1902, 19.

brevicaudatum (Nord., 1832) Dies., 1850a, 306.—Braun, 1892a, 796.—Kroyer, 1852–53a, 1222 (in Barbus fluviatilis Ag.).—Villot, 1898, 542.

clavatum Nord., 1832a, 42–49, pl. 3, figs. 5–10, pl. 4, fig. 5 (in Perca cernua, P. fluviatilis, P. lucioperca); 1833, 286–295, pl. 18, fig. 4, pl. 19, fig. 2; 1840, 630.—Braun, 1892a, 654, 794.—Claparède, ——, 198, pl. 8, figs. 1–3.—Crep., 1839a, 289.—Dies., 1850a, 305 (to Tylodelphys); 1858c, 316 (to Tylodelphys).—Duj., 1845a, 475.—Gescheidt, ——, 428.—Henle, 1833a, 22.—Kroyer, 1838–40a, 21; 1846–53a, 253 (in Perca fluviatilis, Esox lucius).—Moul., 1856a, 220–221 (in eyes of perch by Nord.; Esox lucius Duj.; P. fluviatilis Moul.; Lake Leman).—Olss., 1893, 8.—Steenstrup, 1842, 58.

cobitidis Linst., 1890d, 179 (in Cobitis barbatula).—Braun, 1891d, 424 (in Cob. barb.).

craniarium (Dies., 1858) Cobbold, 1860, 49–50 (includes Trematodum sp. Leydig) (in Cobitis fossilis).

cuticola (Nord., 1832) Dies., 1850a, 306; 1858c, 317–318 (to Holost.) (in Pomotis vulgaris; Phila.; Leuciscus dobula, L. rutilus; Anglia; Gobio vulgaris, *Phoxinus lævis*).—Braun, 1892a, 796.—Koch, 1904, 795.—Kroyer, 1838–40a,

DIPLOSTOMUM—Continued.

578 (in Perca fluviatilis L.).—Lint., 1898, 513, pl. 41, figs. 6–10, pl. 42, figs. 1–5.—Staff., 1904, May 3, 494 (encysted in liver of Ambloplites rupestris; Canada).—Villot, 1897; 1898, 541, 542 (larva of Hemist. denticulatum) (in Phoxinus lævis).—Wellner, 1899, 51–53, 2 figs. (in Weissfisch).—Also reported for Abramis brama, A. vimba, Blicca bjœrkna, Cobitis tænia, Chænobrythus gulosus, Chondrostoma nasus, Cyprinus carpio, Eupomotis auratus, E. pallidus, Gobio fluviatilis, Idus melanotus, Lepomis auritus, Leuciscus erythrophthalmus, L. idus, L. vulgaris, Scardinius erythrophthalmus.

[*fusca*=Geomys bursarius, mammal].—Stiles, 1896, 183.

grande Dies., 1850a, 305, 307 (in Ardea leuce, A. agami; Matogrosso, Brazil); 1855, 60, pl. 1, figs. 1–12; 1858c, 318; 1859c, 424 (in Strix nivea).—Brand., 1888a, 12, 18, 26, 50, 54–55 (syn. Hemist. macropterum) (in Ardea leuce; Brazil); 1890a, 554, 576, 581, pl. 39, fig. 14 (in Ardea leuce; Brazil).—Braun, 1892a, 582; 1893a, 901.—Leidy, 1859, 110.—Mont., 1888a, 12.—Poir., 1886, 328.

lenticola Linst., 1878, 226–227, fig. 9 (in Abramis vimba).—Braun, 1892a, 796.—Poir., 1886, 336 (in Ab. vim.).

longe Braun, 1892a, 581, see longum.

longum Brand., 1888a, 25, 55, 57, 61 (in Crocodilus; Brazil); 1890a, 553, 582, 584, pl. 39, figs. 1–9 (in Croc. by Natterer; Brazil).—Braun, 1892a, 569, 582, 586, 672; 1893a, 901.

macrostomum Jægers., 1900a, Jan. 6, 33–37, figs. 1–5 (in Telmatias major; ?Upsala).

mülleri Cobbold, 1860a, 50 (includes D. petromyzi fluvialis Mueller, D. rachiæum Mueller?, Tylodelphys Dies. Revis., p. 12) (in Petromyzon fluviatilis).

musculicola (Waldenburg, 1860) Braun, 1892a, 796.

mutabile (Dies., 1850) Par., 1896, 2, to (Codonocephalus) (in Rana esculenta; Italy).

parvulum Staff., 1904, 494 (in Semotilus bullaris; Canada).

petromyzi fluviatilis Dies., 1850a, 307, based on Mueller, 1840, 30 (in Peteromyzon fluviatilis); 1858c, 318 (to Tylodelphys).

pseudostomum (Will.-Suhm, 1870) Poir., 1886, 334–339, 345, pl. 18, figs. 3–4, 5, 6, pl. 19, figs. 2, 4.—Brand., 1888a, 34, 50, 55–56 (in Crocodilus; Brazil); 1890a, 563, 576, 582–583, pl. 39, figs. 10, 11 (in Croc. sp.).—Braun, 1892a, 593; 1893a, 901.

putorii Linst., 1877, 191, pl. 14, fig. 21 (in Fœtorius putorius).—Brand., 1888a, 42; 1890a, 572.—Braun, 1894a, 796.

rachiæum Crep., 1839, 289.—Mueller, 1839, 198.

rachidis Par., 1896, 2, for rhachiæum to (Tylodelphis).

rachieum Fraip., 1880c, 419, for rhachiæum.

rachineum Mueller, (1842).

rhachiæum Henle, 1833a, 19–22, pl. 1, figs. 18–22 (in Rana).—Brand., 1888a, 15.—Braun, 1892a, 654 (rachiæum), 795.—Claparède, ——, 198, pl. 8 (rachiæum).—Crep., 1839, 289 (rachiæum).—Dies., 1850a, 305 (syn. of Tylodelphys rhachidis); 1858c, 316 (rachiæum), (syn. of Tylodelphys rachidis).—Duj., 1845a, 475 (rachiæum).—Fraip., 1880c, 419 (rachieum); 1881b, 7 (rachieum).—Hofman, 1899, 184 (rachiæum).—Jackson, 1888, 645 (excretory system).—Kuech., 1855, 187 (rachiæum).—Leidy, ——, 383.—Leuck., 1863a, 526 (rachiæum).—Mont., 1888a, 41 (rachieum).—Moul., 1856a, 221 (rachiæum).—Mueller, 1839, 198 (rachiæum); 1842, — (rachineum) (in Petromyzon fluviatilis).—Par., 1896.

siamense Poir., 1886, 327–333, 336, 340, 345, pl. 18, figs. 1, 2, pl. 19, fig. 7, pl. 20, figs. 1–4 (in Crocodilus siamensis).—Brand., 1888a, 26, 34, 50, 56–57 (in Croc. si.); 1890a, 554, 563, 576, 583.—Braun, 1892a, 717; 1893a, 901.—Mont., 1888a, 12.

spataceum Stoss., 1896, 126 (for spathaceum).

spathaceum (Rud., 1819) Olss., 1876, 29–30.—Braun, 1893a, 901.—Stoss., 1896, 126 (spataceum); 1898, 20 (to Conchosomum).

spathula Brand., 1888a, 54 (syn. Hemist. spathula) (in Falco palumbarius; Wien. Museum); 1890a, 580, pl. 39, fig. 13.—Braun, 1892a, 582; 1893a, 901.—Also reported for Astur palumbarius.

DIPLOSTOMUM—Continued.

spathulæforme Brand., 1888a, 44, 54 (in Strix otus); **1890a, 574, 580–581, pl. 39, fig.** 12 (in Otus vulgaris).—Braun, 1892a, 582; 1893a, 844, 845, 901; 1894, 166.—Wolffhuegel, 1900, 9, 11, 12, 14.—Also reported for Accipiter nisus, Ægolius otus, Buteo vulgaris, Sarcorhamphus gryphus.

sp. Kroyer, 1852–53a, 1051 (in Petromyzon fluviatilis L.).

sp. Lint., 1901, 415, 442, 471.

volvens Nord., 1832a, 28–41, 43, pl. 1, fig. 3, pl. 2, figs. 1–10, pl. 3, figs. 1–4, 9, pl. 4, fig. 6 (in Cyprinus erythrophthalmus, Gadus lota, Perca cernua, P. fluviatilis, P. lucioperca); 1833, 270–286, pls. 18, 19, figs. 1–3 (pl. 19, fig. 1, gives Dist. volvens, probably lapsus); 1840, 630.—Aubert, 1853, 90.—Brand., 1888a, 12; 1890a, 569.—Braun, 1892a, 636, 637, 648, 653, 654, 794–796; 1894, 166, 167; 1894k, 681 (larva of Hemist. spathaceum).—Brown, A. W., 1899d, 490, 493, 494.—Claparède, ——, 100, pls. 4, 5.—Cobbold, 1858b, 159.—Crep., 1839a, 289; 1846, 150, 153.—Dies., 1850a, 306; 1858e, 317.—Duj., 1845a, 474–475.—Fraip., 1880a, 400; 1880c, 419, 420, 429–433, 441, 442, 443, pl. 18, figs. 18–21 (in Leuciscus rutilus, Chondrostoma nasus); 1881b, 1, 7; 1883a, 36.—Gamb., 1896a, 64, fig. 31 (as Dip. (Tetracotyle) volvens).—Gescheidt, 1833, v. 3, 426–428.—Henle, 1883a, 22.—Jackson, 1888, 645 (excretory system).—Kroyer, 1838–40a, 21, 579, 609; 1852–53a, 1224 (in Leuciscus rutilus L., L. erythrophthalmus, Lota vulgaris, Perca fluviatilis L., Acerina cernua L.).—Looss, 1885b, 20.—Mont., 1888a, 41, 42, 43, 45, 46.—Moul., 1856a, 220 (in eye of Perca fluviatilis, P. cernua, P. lucioperca, Gadus lota, Cyprinus erythrophthalmus).—Mueh., 1898, 16.—Olss., 1893, 9 (in Leuciscus phoxinus).—Steenstrup, 1842, 58.—Villot, 1898, 542 (larva of Hemist. spathaceum).—Also reported for Acerina cernua, A. vulgaris, Lota communis, Lucioperca sandra.

DIPLOSTOMUM Brand., 1888a, 50, 54–58, proposed as new genus [no type given], [not Nord., 1832], for abbreviatum, bifurcatum, grande, longum, pseudostomum, siamense, spathula, spathulæforme see under foregoing entry; **1890a.**—The generic name Diplostomum Brand. falls as a homonym.

DIPLOSTOSTOMUM Mont., 1888a, 91 for Diplostomum.

DIPLOOZON Mont., 1888a, 64 (for Diplozoon).

DIPLOOZOON Mont., 1888a, 64 (for Diplozoon).

DIPLOZOON Nord., 1832a, 56–76 (m. paradoxum); 1840, 599.—Beard, **1905, v. 93,** 383, 2 figs.—Ben., 1858a, 1861a, 11, 38, 168, 172, [200], 345; 1868, 28.—Ben. & Hesse, 1864, 61, 64, 96.—Brand., 1891b, 266; 1894a, 308.—Braun, 1889k, 620, 621; 1890b, 125, 127, 128; 1891d, 422; 1890a, 413, 414, 442, 451, 461, 468, 472, 475, 477, 480, 481, 482, 485, 491, 492, 493, 494, 495, 498, **500, 506, 507,** 511, 514, 515, 516, 517, 518, 520, 522, 523, 533, 534, 535, 546; 1893a, 890; 1895, 125; 1899, 3.—Burm., 1837a, 530; 1856a, 251.—Carus, 1833, 477.—Cerf., 1895h, 918, 920; 1896, 514, 515; 1899a, 451.—Chatin, 1880f, 591–592; 1881a, 310–312; 1887d, 1005.—Crep., 1838, 84; 1839a, 292.—Dies., 1850a, 90, 422–423, 425; 1858e, 269–272, 315 (in subf. Placoplectana), 387.—Duj., 1845a, 315.—Gamb., 1896a, 55, 57, 61, 73.—Goldb., 1855a, 19.—Goto, **1891a, 167, 168,** 169, 170, 176, 177, 178, 181, 183, 186, 187; 1891c, 103; 1893a, 800.—Haswell, 1892b, 149; 1893c, 114.—Hoyle, 1890, 539.—Ijima, 1884, 637, 638.—Jackson, 1888, 649 (=Diporpa), 653.—Juel, 1889, 33.—Kath., 1894a, 148, 155.—Leuck., 1863a, 48; 1879, 58, 62.—Leuck., 1886d, 45, 48.—Looss, 1892a, 72–73; 1893b, 810.—Mayer, 1841a, 34.—Mont., 1888a, 11, 15, 37, 49, 51, 52, 53, 55, 57, 58, 59, 60, 61, 63, 64 (Diploozon, Diploozoon), 65, 66, 70, 83, 84, 86, 89, 98, 99; 1892, Oct. 7, 186, 213 (in Octocotylinæ); 1893, 111; 1903, 336 (subf. Octobothrinæ).—Moul., 1856a, 10.—Pintner, 1891, 728.—Pratt, 1900a, 646, 651 (key), 656, fig. 31.—Tasch., 1879, 35, 69; 1879, 232, 233, 238, 249 (syn. Diporpa Duj.).—Wallenstedt, 1847, 7.

1835: Diplozoum Burm., 1835b, 187, for Diplozoon.

1888: Diploozoon Mont., 1888a, 64, for Diplozoon.

1888: Diploozon Mont., 1888a, 64, misprint.

1900: Diplozoön Pratt, 1900a, 646, 651.

nipponicum Goto, 1891a, 151–192, pls. 21–23 (in Carassius vulgaris); 1891b, 472–473.—Braun, 1891d, 422.—Mont., 1893, 8, 111.

paradoxum Nord., 1832a, 56–57, pl. 5, figs. 1–5, pl. 6, figs. 1–2 (in Cyprinus brama); 1833, 373–396, pl. 20, figs. 1–4; 1840, 547, 597, 599.—Ben., 1858a, 1861a, 39–44, 53, 66, 99, 169, 176, 186, pl. 4, figs. 1–12.—Braun, 1883, 45, 51, 57, 71; 1890a, 409, 415, 420, 428, 438, 439, 445, 451, 452, 455, 456, 457, 465, 472, 479, 483, 489,

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492, 499, 506, 512, 535, 548, 550, 551; 1891a, 52, 53.—Burm., 1837a, 530.—Cobbold, 1872b, 90.—Crep., 1838, 89 (in Cyprinus balerus, C. brama, C. jeses, C. rutilus, C. vimba; on gills), 164; 1839a, 292.—Dies., 1850a, 423; 1858c, 282, 387 (in Carassius gibelio; Rhodeus amarus); 1859c, 444.—Duj., 1845a, 316.—Ehrenb., 1835, 128.—Fraip., 1880a, 400 (paraodoxum); 1880c, 416, 418, 433; 1883a, 36.—Gamb., 1896a, 59–61, figs. 27, 28.—Gosse, 1857a, 125.—Goto, 1891a, 151, 175, 185.—Hausmann, 1897b, 4, 7, 20, 22, 36–38 (in Abramis brama, Cottus gobio, Gobio fluviatilis, Phoxinus lævis).—Heller, 1857a, 109–110, 5 figs.—Hoyle, 1890, 539, fig. 3, A.—Ijima, 1884c, 637.—Jackson, 1888, 650.—Jacoby, 1900, 3.—Kerbert, 1881a, 556.—Kholodk., 1899a, 148, fig. 176.—Kollar, 1835, 81; —, 82.—Kroyer, 1846–53a, 388, 410, 419, 434, 446, 462; 1852–53a, 1223, 1224 (in Abramis balerus, A. blicca, A. brama, A. vimba; Leuciscus erythrophthalmus, L. idus, L. rutilus).—Lamarck, ——, 599.—Leuck., 1863a, 450.—Looss, 1885b, 18; 1892a, 81.—Mayer, 1841a, 23.—Mont., 1888a, 9, 38, 40, 52, 58, 70; 1890, 421; 1892, Oct. 7, 186; 1893, 110, 111.—Mueh., 1898, 12, 18.—Olss., 1893, 6.—Par., 1896, 1.—Par. & Perugia, 1890, 7.—Paulson, 1862, 16 pp., 1 pl.; 1867, 1–24.—Pratt, 1900a, 656, 657, fig. 31.—Sieb., 1835, 58, 59; 1836, 105; 1836, 238; 1839, 163, 164; 1842, 459; 1850, 36–37; 1851, 10 Mar., 62–68 (conjugation); 1854, 52–58, 201–206.—Sons., 1897, 259.—Sramek, 1901, 95, 109, fig. 63 (in Abramis brama Cuv.).—Tasch., 1879, 249 (syn. Diporpa dujardini Dies.); 1879, 613.—Vogt, 1841, 33–36, pl. 2, figs. 10–12.—Wagener, 1857, 96, pls. 9–10.—Zeller, 1872, 3 May, 168–180, pl. 12, figs. 1–13 (development); 1872, Sept., 99–112; 1888, 23 Mar., 233–239, pl. 19 (genital organs); 1888, 427–428.—Also reported for Blicca bjœrkna, Carassius vulgaris, Chondrostoma nasus, Cyprinus blicca, C. cephalus, C. gobio, C. leuciscus, Gasterosteus aculeatus, Idus melanotus, Leuciscus cavedanus, L. prasinus, Lota vulgaris, Scardinius erythrophthalmus.

DIPLOZOUM Burm., 1835b, 187, for Diplozoon.

DIPORPA Duj., 1845a, 316–317, pl. 3, fig. C (m. dujardinii Dies., 1850).—Ben., 1858a, 1861a, 38, 199.—Ben. & Hesse, 1864, 61, 64.—E. Bl., 1847, 337–338.—Braun, 1883, 57; 1890a, 424, 442, 452, 506, 507, 518, 535.—Chatin, 1880f, 591–592; 1881a, 310–312.—Cunningham, 1887a, 279.—Dies., 1850a, 289, 420, 425; 1858c, 269–272; 1858e, 315, 386.—Gamb., 1896a, 61.—Goldb., 1855a, 19.—Heller, 1857a, 110.—Jackson, 1888, 649.—Looss, 1892, 81.—Kroyer, 1846–53a, 434 (in Leuciscus erythrophthalmus).—Mont., 1888a, 70, 83, 84, 89.—Tasch., 1879, 232, 249 (syn. Diplozoon Nord.).

dujardinii Dies., 1850a, 420 (in Cyprinus erythrophthalmus) (based on Duj., 1845a, 316–317, pl. 3, fig. c); 1858c, 271; 1858e, 386 (in Phoxinus laevis).—Ehrenb., 1852, 28.—Olss., 1893, 6.—Sieb., 1850, 36–37; ——, 62.—Tasch., 1879, 249 (syn. of Diplozoon paradoxum Nord.).—Also reported for Abramis alburnus.

DISCOCOTYLE Dies., 1850a, 290, 423–424 (only positive species, hence type sagittata), 425.—Goldb., 1855a, 19; Tasch., 1879, 239.

1858: Placoplectanum Dies., 1858e, 315, 384, Discocotyle renamed, hence type sagittatum.

1890: Discotyle Braun, 1890a, 518, misprint.

hirundinaceum (Bartel, 1834) Dies., 1850a, 424 (sp. inq., nomen nudum except for habitat, Coregonus wartmanni).

leptogaster (Leuck., 1830) Dies., 1850a, 424 (in Chimera monstrosa; Christiania).—Kroyer, 1852–53a, 812 (in Ch. mon. L.).—Tasch., 1879, 245 (to Octobothrium).

sagittata (Leuck., 1842) Dies., 1850a, 423–424 (in Salmo fario).—Kroyer, 1838–40a, 616 (in Salmo fario).—Tasch., 1879, 244 (to Octobothrium).

DISCOCOTYLEA Dies., 1850a, 419, 422 (supergeneric).

DISCOCOTYLEÆ Dies., 1850a, 288, 289, 290 (supergeneric).—Goldb., 1855a, 17, 19.

DISCOTYLE Braun, 1890a, 518, misprint for Discocotyle.

DISCOTYLEA Cerf., 1899a, 351.

DISPLOSTOMUM Mont., 1888a, 71 (for Diplost.).

DISSICHYA Cosmovici, 1887a, 129, 131 (includes Amphist., Bilharzia, Dist. Gasterost., Hemist., Holost.).—Mont., 1888a, 84.

DISTOAM Cobbold, 1875n, misprint for Distoma.

DISTOMA Retzius (1782); 1790, 32 (Fasciola Linn., 1758, renamed, hence type hepatica) [not Distoma Savigny, 1816, mollusk; Distomus Gærtner, 1774,

DISTOMA—Continued.

Ascidiæ compositæ; Distomus Steph., 1827, coleopteron; not Distoma Gærtner of Herdmann, 1890].—Abildg., 1790, 36 (syns: Fasc. hep. Linn., Fasc. Mueller, Planaria Gœze, Fasc. Bloch).—Adam, 1879, 159.—Aitken, 1872, 203, fig. 36a.—Albarran, 1897b, 1096.—Anacker, 1885e, 438; 1885d, 380, 381; 1887b, 350.—Andral, 1829d, 617.—Ariola, 1899a; 1899 (in 129–138); ——, 299.—Ashley, 1856, 7, 8.—Audouin, 1824a, 563–564 (polyp).—Baillet, 1866b, 99.—Bellingham, 1844a, 422–423.—Ben., 1870c, 142.—Ben. & Hesse, 1864a, 61.—E. Bl., 1847a, 291–292.—R. Bl., 1888a, 543, 567, 570, 575, 577, 584, 585, 590, 593, 594, 595, 597, 598, 599, 601, 602, 603, 605, 614, 615, 622, 624, 625, 627, 628, 630, 631, 636, 641, 643, 644, 646, 647; 1891p, 609; [1892b], 1026–1030, figs. 1–7.—Bojanus, 1817, pl. 9.—Brand., 1888a, 9; 1892b, 506.—Braun, 1883a, 59, 70; 1890a, 473, 479, 514, 515; 1891d, 423; 1892a, 570, 599, 635, 696, 715, 720, 735, 767, 769, 770; 1893a, 825, 837, 853, 857, 872, 879, 880, 884, 885, 886, 887, 890, 893, 894, 895, 902, 908, 913, 918; 1893f, 382, 383, 388, 389; 1893g, 802; 1894i, 604; 1895b, 17, 134, 136, 138; 1900b, in 217–236, 1 pl.; 1900, 3; 1900g, 254; 1900h, 3, 6; 1901e, 323, 332, 333, 338, 339, 340, 342; 1902b, 41, 51, 52, 53, 79, 117.—Burm., 1837a, 529; 1856a, 250.—Bremser, 1824, 133–134.—Buttel-Reepen, 1900a, 585–598, figs. 1–9 (2 species); 1902a, 282–283.—Carus, 1835a, 90, 91, 93; 1863, 479.—Chiaje, 1833, 11.—Cobbold, 1879b, 15; 1883p, 401, fig. 16; 1883x, 514.—Cohn, 1902h, 880.—Cosmovici, 1887a, 128.—Crep., 1837a, 309–329; 1839a, 288.—Daldorf, 1793, 159 (syn. of Fasc. hep.).—Davaine, 1877a, lxxiv.—Delafield & Prudden, 1897a, 130.—Dies., 1850a, 288, 293 (of Baer syn. of Rhopalocerca), 295 (of Fil. and Steenstrup syn. of Cerc.), 301 (of Baer syn. of Heterost. Fil.), 307 (of Rud. syn. of Hemist. Dies.), 318 (of Zed. syn. of ? Diplodiscus Dies.), 319 (of Zed. syn. of Monost. Zed.), 329 (of Ammon, syn. of Monost. lentis Nord.), 331–339 (syns. Fasc. Linn., Planaria Auct., Schisturus Rud., Alaria Blainv., Brachylemus E. Bl., Apoblema E. Bl.), 400 (of Bojanus syn. of Amphist, Rud. ex parte; of Rud. syn. of Rhopalophorus Dies.), 418 (of Henle syn. of Heptast. Otto Schomburgk), 573 (of Zed. syn. of Tetrabothriorhynchus Dies.), 609 (of Humboldt syn. of Pentast. Rud.); 1855a, 377, 380, 383 (of Fil., Sieb., & Steenstrup, syn. of Cercariæa), 384, 385, 396; 1858e, 312, 329 (syns. Fasc., Plan., Dist., Schisturus, Alaria, Brachylemus, Apoblema, Clinost.), 331.—Doyère, 1838a, 131–132; 1838b, 398–399.—Duj., 1845a, 381–388.—Dunglison, 1893a, 338, 710, 1174.—Eichwald, 1829a, 248.—Eiss, 1838a, 21.—Encyl. méthodique, Par., 1824, v. 2, 256–285.—Fabricius, 1794, 26; [1799a], 149.—Fil., 1837a, 337.—Fischer, 1840, 157.—Froriep, 1833, 428–432.—Gamb., 1896a, 73.—Goldb., [1855a], 17, 27.—Goto, 1891a, 158; 1893a, fig. 2.—Gunther, 1858, 205.—Gurlt, 1831, 370.—Hackley, (1886a), 518–519, figs. 880–885.—Hahn & Lefèvre, 1884a, 515–549; 1884, 806.—Hausmann, 1897b, 16.—Henle, 1835a, 597.—Herdmann, 1890, 617 (Distoma of Gærtner, 1890, 617, f. Distomidæ of Ascidiæ compositæ).—Hoyle, 1890, 535, 539, 540.—Huber, 1896a, 574 (from *δίστομος*).—Jacoby, 1899c, 1–30, pls. 1–2, figs. 1–16; 1899d, 30 pp., 2 pls., figs. 1–16.—Jægers., 1901b, 979.—Joy, 1835a, 504.—Kajama & Nanba, 1892a, 32–36, 42–46 (Japan).—Kholodk., 1898a, 25, 26.—Knoch, 1862d, 19.—Kolenati, 1857, 11.—Kowal., 1895g, 1, 24 (41, 64); 1896g, 70, 71.—Kuech., 1855a, 182.—Lamouroux, 1824a, 559–563.—Leblond, 1836c; 1836f, 4.—Leidy, 1850a, 301–310, pl. 43, figs. 1–16 (2 species); 1884a, 47–48.—Leuck., 1863a, 451, 461, 524, 528–530; 1879, 136; 1886d, 7, 34, 35, 62, 67, 105, 117, 204, 715.—Linst., 1879a, 165–188.—Lint., 1901b, 408.—Looss, 1885a (2 species); 1885b, 56; 1892a, 126; 1893b, 816, 817, fig. 1; 1896b, in 1–252, 16 pls.; 1899b (divided into various genera), 533, 535, 536, 537, 538, 539, 540, 542, 543, 545, 546, 556, 658; 1901b, 191, 192, 193, 195, 196, 197, 200, 210; 1900d, 603; 1902m, 701, 719 (in ref. to Monost. prismaticum), 720, 732, 746, 750, 751, 752, 753, 756, 775, 795, 796, 812, 813 (as collective genus), 842, 865.—Meltzer, 1894a, 406–407, figs. 1–3; 1895a, 137.—Milner, 1858, 17.—de Miranda, (1903a), 137–139; 1904a, 280.—Miyake, 1894, 1–6, 1 pl.—Mlinarich, 1832, 13.—Moniez, 1896, 86, 89–90.—Mont., 1888 (thesis), 4, 7, 8, 9, 12, 22, 24, 31, 33, 38, 43, 50, 53, 54, 57, 64, 71, 83, 84, 89, 92, 104; 1889k, 132–134; 1889l, 612–613; 1892, 29; 1892, 687; 1892, Oct. 7, 189; 1893, 229, pl. 1; 1893, 427; 1894, Feb. 1, 16–21.—Moul., 1856a, 12, 15, 121.—Mueller, 1839, in 171–251, pls. 1–4.—Muller, 1850, 496.—Neumann, 1892, 345.—Nord., 1840, 544, 613, 614 (of Zed. syn. of Fasc.).—Odhn., 1902, 43.—Osborn, 1898, 301–310, figs. 1–4 (in Anodonta plana).—Perrier, 1903, 682.—Pontallié, 1853, 103–105 (2 species).—Pratt, 1900a, 645; 1902a, 889; 1902 (4 species).—Raf., 1815, 151 (of Zed. renamed Distomopsis).—Rail. & Marotel, 1898, 37.—Rathke, 1799, 69.—Rawitz, 1893, v. 1, 1694–1697.—Reinsch, 1839, 14.—Rud., 1809, 6, pl. 5, figs. *1–3, pl. 6, figs.* 7–8, 21–22, 37–38, 352; 1819, 92, 362–363.—Schneidemuehl, 1896,

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295, 296.—Schneider, 1866, 334.—Seely, 1906, Apr., 249–254, figs. 1–3 (2 species).—Setti, 1897, in 50 pp., 2 pls.; 1897, in 198–247, 2 pls.; ——, 49.—Shaw, 1901, 263, 809.—Sieb., 1836, 232–240 (as genus); 1854, 20, 29.—Simon, 1897, 259 (Distomi).—Sluiter, 1898, 1–64, pls. 1–7.—Sommer, 1880, 195–202, figs. 3–10; 1895, 116–123, figs. 15–22.—Sons., 1889, 276.—Staff., 1900, in 399–414 (5 species).—Steenstrup [1859, 167–170].—Stiles, 1901, 163, 164, 165, 172, 174, 194, 196; 1905z, 14.—Stiles & Hass., 1898a, 87, 88, 89.—Stoss., 1892, 42 pp.; 1892, 4, 5, 7, 12; 1898, 31; 1899, in 1–6, 1 pl.; 1903, 193–201; 1905, Jan. 31, 23.—Stowell, 1879, Jan., 85–93, pl. 9.—Tasch., 1879, 232, 233.—Valentin, 1811, 6.—Verrill, 1870, 172, 219, 220.—Veterinarian, Lond., 1897, v. 70, Oct., 522 (in the heart).—Villot, 1870, 9–13 (adults).—Vogt, 1878, 9.—Wagner, 1883, 120–122.—Ward, 1896, in 257–272, figs. 1–10.—Weltner, 1896, 199–200, 3 figs. (in Wasserjungfern).—Wolf, 1903, 610.—Zed., 1800a, 161–164.—Ztschr. f. Fleisch. u. Milchhyg., 1906, Nov., 66.

——, anatomy of: Baer, 1828f, 197–198 (anus).—Chatin, 1882d, 200–202 (muscles).—Crety, 1892d, 21–26, figs. 1–2 (suckers, tactile organs); 1893a, 380–384 (suckers, tactile organs).—Jackson, 1888, 643, 644.—Linst., 1873e, 95–108, pl. 5, figs. 1–6 (new species and female organs); 1873f, 231–232 (sexual organs).—Macé, 1882, 91 pp., 3 pls. (grande douve du foie).—Nardo, 1827, v. 1, 68–69 (anus).

——, biology of: Braun, 1890d, 568.—Brown, 1882b, 624–630 (liver-fluke).—Harms, 1891a, 249–250 (Aufnahme).—Pontallié, 1851, 217–219 (encysted adults).—Schauinsland, 1882, Nov. 25, 494–498, pls. 19–20 (embryology).—Wymann, 1851, v. 6, 65.

——, classification of: R. Bl., 1885a, 541; 1891p, 609–611.—Duj., 1845a.—Looss, 1899b, 521–784, pls. 24–32; 1900a, 390–401; 1900b, 458–466; 1901b; 1901c; 1901, Feb.—Luehe, 1899k, 524–539; 1900p, 305–306.—Mont., 1892, Oct. 7, 214.—Stiles & Hass., 1898a.

——, geographic distribution of: Billet, 1898a, 279–282, figs. 22–23 (Haut-Tonkin).—Cobbold, 1876h, 209–212 (Asia).—Johnston, 1901a, 334–338, pl. 22, figs. 1–4 (Australia); 1901b, 598 (Aust.); 1902a, 326–330, pl. 13, figs. 1–7 (Aust.); 1902b, (Aust.); 1903a, 899 (Aust.).—Lint., 1900a, 267–304 (in fish at Woods Hole); 1901a, 267–304 (Woods Hole); 1901b, 405–492 (Woods Hole); 1902a, 449–450 (Woods Hole).—Looss, 1900a, 390–401 (Egypt); 1900b, 458–466 (Egypt).—Mochizuki & Tsutsumi, 1899, Nov. 20, 13–24 (Shigaken).

——, in collections: Stoss, 1904, June 23, 1–14, pl. 2, figs. 1–3 (Naples); 1905, Jan. 31, 23–24 (Naples).

——, in various animals: Bavay, 1902a, 199–200, 1 fig. (sp. in Rhizostoma cuvieri); 1905, July, 63.—Heymann, 1905, 97–98, fig. B (Kachuga tectum).—Weltner, 1896, 199–200, 3 figs. (Libellulidæ).

——, in amphibia: Groenouw, 1898a, 60–62, 1 fig., 85–92 (eye of Rana esculenta); 1903a, 65 (frog).—Guenther, 1853a, 95–99, pl. 1, figs. 1–6 (in Rana temporaria).—Klein, 1905, 59–80, pl. 5, figs. 1–8 (Rana hexadactyla); 1905, 24 pp. (R. hex.); 1906, Jan. 30, 41–42 (R. hex.).—Looss, 1894a, 296 pp., 192 figs. (and fish); 1894b.—Luehe, 1901p, 166–177 (Indian Anura); 1901q, 658 (Indian Anura).—Schellenberg, 1895, 170–171, figs. 1–2 (frog: muscle); 1895, Aug. 24, 183.—Staff., 1903, Oct. 21, 822–830, 1 pl., figs. 1–5 (Canadian Urodela); 1904, May 17, 281 (Canadian Urodela).—Stoss, 1889, v. 11, 60–74; 1889, Oct., 521; 1889, Nov. 8, 581–582.—Vallada (1882), v. 29, 35–39 (crustacea).—Vulpian, 1859, 150–152 (frogs); 1860, pl. 11, fig. 4.

——, in aves: Braun, 1899a, 1–4 (in Porphyrio).—Linst., 1906, 174 (in Plotus melanogaster).—de Miranda Ribeiro, 1903a, 137–139; 1904a, 280.—Nicoll, 1906, 515 (Colymbus septentrionalis).—Rail., 1890, 131 (pigeon).—Spencer, 1889, 109–110 (egg of fowl).—Stoss., 1892, v. 13 (2), 143–196; 1892, 54 pp.

——, in fishes: Ariola, 1899, 129–138 (marine).—Catois, 1897, xxxiii (meninges of Gadus).—Chavannes, 1851a, 210 (Corregonus fera).—Johnston, 1902a, 326–330 (Pristiophorus cirratus); 1905, July, 57 (Pr. cir.).—Kroyer, 1838–1840a, 612 (Rhombus vulgaris); 1843–1845a, 517 (Cyclopterus lumpus); 1852–53a, 745 (Orthagoriscus mola).—Lint., 1900a, 267–303; 1901a, 267–304; 1901b, 405–492; 1902a, 449–450; 1905, 349, 350, 353, 359, 360, 361, 364, 366, 372, 373, 374, 382, 385, 389, 393, 397, 402, 403, 404, 410, 413, 414, 415, 416, figs. 167, 168, 169, 171, 172, 173, 179, 198, 199, 205, 208, 209, 210, 213, 214, 215.—Looss, 1894a, 296 pp., 192 figs. (and frogs); 1894b, 706–711 (and frogs); 1901d, 398–405, 437–442, figs. 5–6 (Labriden; Triest).—Luehe, 1900w, 504–509 (gall-bladder;

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Mediterranean); 1900x, 792.—MacCallum, 1895, July, 401–412, figs. 1–8; 1895, 12 pp.—Mont., 1889k, 132–134; 1889l, Nov. 15, 612–613 (Acanthias vulgaris).—Schrœder, 1895, Oct. 26 (pike); 1896, Mar. 21, 426.—Ssinitzin, 1905, 210 pp., 6 pls., 9 figs. (and frogs: near Warschau); 1906, Nov. 13, 681–689 (and frogs: near Warschau).—Stoss., 1886, 66 pp.; 1888.—Tilesius, 1810, 335–375, 6 pls., 363–374, pl. 19, figs. 8–10 (Gadus wachnia).

———, in mollusks: Blochmann, 1892b, 649–652 (Helix hortensis).—Dies., 1850a, 298 (of Bojanus syn. of Cerc. helicis viviparæ sp. inq.; in Paludina vivipara).—Dubois, 1903, 178–179 (in Mytilus gallo-provincialis).—Huet, ——, 20 pp., 1 pl. (Cardium edule).—Leidy, 1847c, 220–221 (Helix alternata).—Osborn, 1898, 301–310, figs. 1–4 (Anodonta plana; Chautauqua, N. Y.).

———, in insects: Ruge, 1904, June 30, 520; 1904, 174–176; 1905, Apr. 15, 420 (Anopheles maculipennis).—Schoo, 1902, Feb. 8, 283–286, figs. 1–2 (in Anoph. claviger); 1902, June 17, 358–359; 1905, July 1, 63.

———, in mammalia: Braun, 1893e, 347–355 (cat); 1893f, 381–392, 422–428; 1894, 691–696; 1900f, 387–391 (Chiroptera).—Cobb, 1897a, 453–481, 1 pl., 26 figs. (sheep).—Duncker, 1881a, 23–25, 55, 154, 159–160; 1884a, 39–42 (muscle, hogs).—Erc., 1875a, 391–441, 1 pl., figs. 1–9 (dogs); 1875b, 88–91 (dogs); 1875c, 413–416 (dogs); 1875e, 33–40 (dogs); 1875f, 274–279 (dogs); 1875g, 254–255 (dogs); 1876a, 379 (dogs).—Galli-Valerio, 1893a, 173–182, pl. 2, figs. 1–6 (embolism, horse); 1895c, 266 (horse).—[Hoppen, 1881a, 39 (muscle, hog).]—Johnston, 1901a, 334–338, figs. 1–4 (Platypus); 1901b, 598.—Hutcheon, 1900i, 497 (Duiker antelope).—Katsurada & Saito, ——, v. 39 (3), 506; 1906, Nov. 13, 2264 (pancreas, cattle).—Leuck., 1881b, 46 (muscle, hog).—Marchi, 1873, 304, pl. 5, fig. B (Delphinus tursio).—Meltzer, 1894a; 1895a (in lungs of cattle).—Morot, 1889, Jan. 30, 37 (calf).—von Ratz, 1893, 249 (horse).—Rec. d. méd. vét., Par., 1885, Jan. 15, 60–62 (pork).—Rivolta, 1884, v. 16, 20–28, pl. 1 (cat and dog).—Sons., 1895, 1157–1160 (Carnivora); 1896, v. 20, 709.—Stoss., 1892, 1–42.—Tright, 1885, Apr., 84–85 (dog).—Villot, 1875, 467 (Delphinus delphis).—Welsch, 1881, June 15, 97 (pork).—Willach, 1892, Apr., 131 (lungs, horse); 1892, 118–124 (horse); 1892, 239–241 (bull); 1893, Sept. 1, 289 (horse); 1893, v. 8 (6–7), 80 (cattle).

———, in man (Homo): Askanazy, 1904, May 28, 897; 1904, July, 210; 1904, July 1, 74–75.—R. Bl., 1888a, 631.—Braun, 1894i, 602–606.—Lankester, 1857b, 433–437.—Mueller, 1842, v. 2, 559; 1842, 85 (fœtus: spinal marrow).—Poir. 1888, v. 8.1, 49.—Sons., 1895, 1157–1160; 1896, v. 20, 709.—Tommasi (1881, fasc. II).—Valentin, 1840, 317–319 (fœtus: spinal canal).

———, in reptiles: Heymann, 1905, v. 22 (1–2), 81–100, figs. 1–5 (Chelonien); 1905, 25 pp.; 1905, 96–97, fig. a (sp. in Dermatemys mavii); 1906, Jan. 30, 41.—Luche, 1900aa, 555–566 (snakes and lizards); 1900bb, 928–930.—Sons., 1892 (Zamenis viridiflavus).—Stoss., 1895, v. 16, 213–239.—Voltz, 1899, Oct., 231–240, pl. 20 (snakes).

———, larvæ of: Calkins, 1901b, 8, 12.

———, new species of: Bell, 1887a, Feb., 116–117.—Cohn, 1902h, 877–882, figs. 1–5.—Erc., 1875a; 1875b; 1875g (in dogs).—Koelliker, 1849b.—Lopez, 1888a, 137–138.—Par., 1896, 1–19; 1896, Sept., 162–180, figs. 1–7.—Pratt, 1903, 23–38; 1905, Feb., 58.

———, reproduction of: Ben., 1858d, 858 (fertilization); 1858e, 159–160, 223–224; 1858h, 312–314.—Fielde, 1888a, 115.—Linst., 1904p, 252–254, figs. 1–4; 1906, Jan. 30, 42.—Ward, 1903, 864.

——— species of: Braun, 1892a, 761; 1893a, 826.—Lint., 1898, 540 (larva), pl. 53, figs. 12–13, pl. 54, fig. 1; 1898, 537–538, pl. 53, figs. 1–2; 1900, 269, 295, 296, pl. 39, figs. 71, 72–81.—Linst., 1906, 174.—Looss, 1899, 521.—Ssinitzin, 1904, 768, fig. c (n. g.).—Staff., 1902, 481.—Wedl, 1857, 247–248, pl. 1, fig. 8.—Weltner, 1896, 199–200.—Wolffhuegel, 1900, 36.

acanthocephalum Stoss., 1887, 94, pl. 10, fig. 40 (in Belone acus; Triest).—Braun, 1892a, 583, 584, 736; 1893a, 874, 911.—Looss, 1899b, 578, 580 (to Tergestia).—Mont., 1893, 102.

acanthoides Rud., 1819a, 114, 415–416 (in Phoca vitulina; Berlin).—Braun, 1901e, 315 316.—Cobbold, 1860a, 33 to Echinost.; 1879, 313.—Dies., 1850a, 382.—Duj., 1845a, 424.—Stoss., 1892, 29 (to Echinost.).

acervocalcaphorum Erc., 1881c, 21 (for acervocalciferum); 1882a, 257.

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acervocalciferum Gastaldi, 1854, 6-7, pl. 1, figs. 6–9 (in Rana esculenta).—Braun, 1893a, 870.—Cobbold, 1860a, 18.—Dies., 1858e, 340–341 (in Pelophylax esculentus).—Linst., 1875, 193.—Rizzo, 1902, 29–30, fig. 2 (in Tropidonotus natrix).—Stoss., 1889, 68.

acervocalciferum ranæ esculentæ Gastaldi, see Dies., 1855, 64, footnote 11.

acervocalcoforum Linst., 1875a, 193 (for acervocalciferum).

acervocalcophorum Erc., 1881e, 20; 1882a, 256 (for acervocalciferum).

actæonis Pag., 1862, 306, pl. 29, fig. 5a (in Acteon viridis; Cette).

aculeatum Nitzsch, in Giebel, 1857, 266 (in Strix bubo).—Braun, 1901a, 14.—Stoss., 1892, 177 (in Bubo maximus).

acutum Leuck., 1842, 33–34, pl. 1, figs. 7a–b (in Mustela putorius).—Braun, 1893a, 877, 881; 1893d, 467; 1901e, 324.—Cobbold, 1860a, 8 (November).—Dies., 1850a, 364.—Duj., 1845a, 439.—Moniez, 1890e, Mar. 1, 242; 1890f, 1; 1890g, Apr. 29, 542–543.—Stoss., 1892, 34 (in Putorius communis).

[*adriaticum* von Dr., a tunicate.]

aduncum Lint., 1905, 327, 333, 409, figs. 195–197 (in Opsanus tau; Beaufort, S. C.).

advena (Duj., 1843) Braun, 1892a, 772 [type of Brachylaima 1843]; 1893a, 831, 864, 880, 894.—Gamb., 1896a, 71.—Reported for Sorex araneus, Limax.

æglefini Ben., 1870, 57.—Braun, 1892a, 728, 734, 759.—Linst., 1873e, 99.—Mont., 1893, 193.—Reported for Gadus euxinus, G. æglefinus, G. morrhua, Merlangus vulgaris.—[See also next entry.]

æglefini (Mueller, 1776) Zed., 1803a, 211 (in Gadus æglefinus; int.).—Dies., 1850a, 343 [syn. of D. simplex Rud.].—Nicoll, 1907, 73.—Rud., 1809a, 370 (renamed D. simplex).—[Type of Sinistroporus, 1904.]

ægyptiacum Looss, 1896b, 33–36, 192, 196, pl. 3, fig. 16, pl. 11, figs. 117–118 (to Fasc.).

æquale Duj., 1845a, 410 (in Strix flammea) to (Brachylaimus).—Braun, 1892a, 767; 1901e, 341.—Cobbold, 1859d, 365 (in Strix perlata); 1860a, 14 (in S. perlata); 1861, 118; 1879, 447.—Dies., 1850a, 363.—Looss, 1899, 650 (perhaps a Clinost.).—Mont., 1893, 155.—Stoss., 1892, 174 (to Mesogonimus).

affine Dies., 1850a, 359 (in Lampris guttatus; Groningæ) [nec Rud., 1819a], 680 (renamed dicorynum) (Monost. tenuicolle Rud., 1819, renamed [not Dist. tenuicolle Rud., 1819a]); 1859c, 430.

affine Rud., 1819a, 110, 406 (in Perca cirrosa; Arimini) [nec Dies., 1850a] (to Derogenes).—Baird, 1853a, 54 (D. appendiculatum Rud.?).—Carus, 1884, 131.—Cobbold, 1860a, 27 (in Scorpæna cirrhosa).—Dies., 1850a, 371 [nec Dies., 1850a, 359].—Luehe, 1901, 479.—Odhn., 1905, 364.—Stoss., 1886, 44.—Wagener, 1860, 190 (in Perca cirrhosa).

agamos Linst., 1872, 1–5, pl. 1, figs. a–c (in Gammarus pulex); 1877, 185; 1878a, 315 (in Gam. pulex L.).—Jackson, 1888, 648 (in G. p.), 652.—Looss, 1885b, 36; 1894, 175.

alacre Looss, 1901, 401–402, 403, fig. 2 (in Labrus maculatus, L. merula, Crenilabrus pavo, C. quinquemaculatus, C. griseus).

alatum (Gœze, 1782) Zed., 1800a, 177–180; 1803a, 213.—Anacker, 1892c, 94.—Blainv., 1824a, 519 (a holostome).—Brand., 1888a, 9, 60 (to Hemist.).—Crep., 1829, 66–67; 1837, 310; 1839, 287.—Dies., 1850a, 308 (to Hemist.).—Fischer, 1840, 158.—Gurlt, 1831, 375–376, pl. 8, figs. 39–40.—Lamouroux, 1822a, 194; 1824a, 563 (Distome ailé).—Mehlis, 1831, col. 184.—Nitzsch, 1819, 399 (to Holost.).—Nord., 1840, 628 (Holost. alatum).—Olfers, 1816, 46.—Rud., 1809a, 400, 402–404 (includes Plan. alata Gœze, 1782; Alaria vulpis Schrank, 1788 [type of Alaria]; Fasc. vulpis Gmelin, 1790; Dist. vulpina Abild., 1790; Festucaria alata Schrank, 1790; Fasc. alata Rud., 1793); 1819a, 112, 412–413.—Also reported for Canis lupus and C. vulpes.

albicolle Rud., 1819a, 98–99, 376–377 (in Falco pennatus; Mus. Vien.).—Braun, 1893a, 875; 1901, 561, 562; 1902b, 99 (to Dicrocœlium).—Bremser, 1824, pl. 9, figs. 3–4.—Cobbold, 1860a, 12.—Crep., 1837, 310.—Dies., 1850a, 348.—Duj., 1845a, 393.—Rail., 1900, 239, 240.—Stoss., 1892, 156 (D. macrourum Rud.).—Also reported for Aquila pennata.

albidum Braun, 1893e, 347–355 (to Dicrocœlium) (in Felis domestica); 1893f, 390, 391, 392, 424, 427, fig. 2; 1894g, 129; 1894i, 606; 1895b, 151.—Askanazy, 1900b, 498, 501; 1901, 72; 1906, 128 (in cats fed on fish; intermediate host).—de Jong, 1896a, 3, 4.—Looss, 1899b, 564–565 (type of Metorchis), 677.—

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Moniez, 1896, 139, 140.—Mueh., 1898, 15, 23 (in Halichœrus grypus), 87, 88, 89 (cf. D. crassiusculum).—Ratz, 1900, 141.—Stiles & Hass., 1894e, 424–425, pl. 1, figs. 1–2.—Ward, 1895, 341.

alborœruleum Stoss., 1889, 28–29 (in Sargus salviani; Triest); 1898, 37.

album Stoss., 1890, 42, pl. 16, fig. 73 (in Cantharus orbicularis; Triest); 1898, 49; 1901, 94.—Braun, 1891d, 424 (in C. orb.).—Looss, 1899, 571 (may belong to Creadiinæ, possibly to Creadium).—Mont., 1893, 85, 86, 94, 102.—Odhn., 1905, 328.—Also reported for Cantharus vulgaris.

allostomum Dies., 1850a, 367 (in Tropidonotus natrix var.) (includes D. colubri murorum Rud., 1819a).—Braun, 1893a, 863.—Cobbold, 1860a, 20.—Erc., 1881e, 67, 68, 69, 70, 73; 1882a, 303, 304, 305, 306, 309 (larva in Helix carthusianella).—Mont., 1893, 187.—Par., 1894, 147.—Stoss., 1895, 229.—Also reported for Natrix torquata, Tropidonotus viperinus.

aloysiæ Stoss., 1885, 161, pl. 6, fig. 28 (in Corvina nigra; Triest); 1886; 24; 1898, 56; 1899, 15.—Braun, 1892a, 567, 663, 737, 1902b, 31.—Looss, 1899, 581.

altemon Ben., 1870, 48, for atomon.

aluconis intestinale Rud., 1819a, 119 (in Strix aluco).—Dies., 1850a, 396.—Duj. 1845a, 442.—Stoss., 1892, 173, syn. of Echinost. apiculatum (Rud.) Cobbold.

aluconis thoracicum Rud., 1819a, 119 (in Strix aluco).—Dies., 1850a, 396.—Duj., 1845a, 442.—Stoss., 1892, 177.

americanum (Hass., 1891) Stiles, 1892e, 148; 1892f; 1892g, 732–733; 1898a, 51 (syn. of Fasc. magna).

amphileucum Looss, 1896b, 55–60, pl. 4, figs. 31–35 (in Naja haje; Alexandria, Egypt); 1899b, 565 (to Metorchis).

amphiorchis Braun, 1899b, 719 (in Thalassochelys corticata at Triest; Chelone mydas; Podocnemis expansa); 1899e, 629; 1901b, 20, 36.—Looss, 1899b, 568, 569 (type of Anadasmus); 1902, 463 (to Orchidasma).

amphistoma Nord., 1840, 616 [probably lapsus].

amphistomoïdes Bojanus, 1817b, 270–277, pl. 9, figs. 1–6 (in Castor fiber) (Dystoma).—Baird, 1853a, 43 (=Amphist. subtriquetrum Rud.).—Dies., 1836, 248; 1850a, 402 (syn. of Amphist. subtr.).—Fischder., 1902a, 42 (syn. of Cladorchis (Stichorchis) subtriquetrus).

ampullaceum Buttel-Reepen, 1900a, 586–596, 597, 598, figs. 1–7 (in Cetacean; Indian Ocean); 1902, Dec. 8, in 165–236; 1902, pl. 6, fig. 25; pls. 7–10, figs. 27–53; text figs. b–g; 1904, Jan. 26, 24–25; 1905, July, in 52–53.—Darr, 1902, 698.

anarhichæ Jacoby, 1900, 13, see anarrhichæ.

anarrhichæ Rud., 1819a, 121–122 (D. anarrhichæ lupi Rathke, from intestine, renamed).—Dies., 1850a, 398 (possibly syn. of D. appendiculatum).

anarrhichæ lupi Rathke, 1799, 70, 146, pl. 2, figs. 3, a, b (in Anarrhichas lupus).—Dies., 1850a, 339, from stomach (syn. of D. incisum Rud.).—Jacoby, 1900, 12. Rud., 1809a, 361, from stomach (syn. of D. incisum), 435–436 (see anarrhichæ).

anatis (Schrank, 1788) Zed., 1800a, xvii, 164, 196–198.—Dies., 1850a, 383 (syn. of D. echinatum Zed.).—Looss, 1899b, 680.—Rud., 1809a, 418 (syn. of D. echinatum Zed.).

anatis domesticæ Rud., 1809a, 431–432 (Hirudo fasciolaris Mueller, Fasc. anatis Bruguière, 1791, renamed); 1819a, 121.—Dies., 1850a, 335 (syn. of D. ovatum Rud.).

anatis fuscæ Viborg, 1795, 243 (at Copenhagen).—Dies., 1850a, 397–398.—Duj., 1845a, 450. Knoch, 1862e, 104.—Rud., 1809a, 431; 1819a, 120–121.—Stoss., 1892, 167, syn. of Echinost. echinatum (Zed.) Cobbold.

ancolatum Braun, 1892a, 677 (for lanceolatum).

anceps Mol., 1859, 845–846 (in Fulica atra; Padua).—Stoss., 1892, 168 (to Echinost.).

ancyli lacustris Dies., 1855a, 400 (to Cercariæum), based on Baer, 1827b, 656 (in Ancylus lacustris).

andersoni Cobbold, 1876, 46, pl. 10, fig. 3 (in Platanista gangetica); 1879, 420.—Linst., 1886, 125.—Stoss., 1892, 19 to (Brachylaimus).

anguillæ (Gmelin, 1790) Zed., 1803a, 222, in Anguilla.—Dies., 1850a, 340 (=? D. *polymorphum* Rud.).—Nord., 1840, 618 (to Fasc.).—Rud., 1809a, 363 (syn. of

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D. polymorphum); 1814a, 101; 1819a, 369 (of Abildgaard, as ? syn. of D polymorphum).—Thompson, 1844, 439 (in Anguilla conger).

anguillulæ Dies., 1850a, 340 (syn. of D. polymorphum), lapsus for anguillæ.

anguis Linst., 1885, 250–251, pl. 15, fig. 27 (in Anguis fragilis).—Braun, 1892a, 642, 663, 693.

angulatum Duj., 1845a, 401–402 to (Podocotyle [type]) (in anguille) [not Fasc. angulata Mueller, 1776].—Braun, 1893a, 910.—Cobbold, 1860a, 29 (in Anguilla vulgaris).—Dies., 1850a, 379.—Kroyer, 1846–1853a, 641 (in Ang. migratoria).—Looss, 1902m, 757, 770, 771 (possibly only one testicle), 772, 827 (type of Podocotyle).—Luehe, 1900, 487, 491, 492.—Odhn., 1905, 320, 321 (syn. of Pod. atomon).—Stiles, 1901r, 193.—Stiles & Hass., 1898a, 92, 93, 97 (type of Pod.).—Stoss., 1886, 17; 1902, 582.

angusticolle Hausmann, 1896a, 391–392 (in Cottus gobio; Basel); 1897b, 4, 6, 20, 22, 24–29, 31, pl. 1, figs. 1–3.—Looss, 1899b, 571 (to Creadium: possibly identical with D. commune Olss., 1868, 31).—Odhn., 1901, 483, 502.

angustum Staff., 1900, 407–408, fig. 6 (in Chrysemys picta).

aniarum Leidy, 1891a, 414 (in Tropidonotus sipedon).

annulatum Dies., 1850a, 386–387 (in Gymnotus electricus; Brazil); 1855, 67–68, pl. 3, figs. 18–21; 1858e, 347.—Braun, 1892a, 571, 584.—Cobbold, 1860a, 36 (to Echinost.).—Looss, 1899b, 595.—Mont., 1888a, 14.—Stoss., 1886, 36.

annuligerum Nord., 1832a, 43, 53–54, 55, 102, pl. 1, figs. 4–10 (in Flussbarsch).—Braun, 1893a, 871.—Cobbold, 1860a, 28; 1879, 458.—Crep., 1837, 310, 313, 326.—Dies., 1850a, 377.—Duj., 1845a, 455.—Gescheidt, 1833a, 431.—Kroyer, 1838–1840a, 21 (in Perca fluviatilis).—Leuck., 1863a, 526.—Moul., 1856, 218–219 (in eye of perch).—Steenstrup, 1842, 59.—Stoss., 1886, 44 to (Brachylaimus).

anonymum Dies., 1858e, 341 (in Gadus æglefinus, G. euxinus, Merlangus vulgaris, M. carbonarius; Ireland) (includes D. Gadi æglefini, Merlangi vulgaris, et M. carbonarii based on Bellingham, 1844a, 428).—Cobbold, 1860a, 25.—Stoss., 1886, 45.

anthos Braun, 1899b, 720 (in Cheloniæ; Yedo); 1901b, 27–29, 33, figs. 20–22, 24, 31.—Looss, 1899b, 575 (appears to be closely related to Echinost.); 1901l, 565, 566; 1902m, 458, 462 (type of Calycodes).

apertum Rud., 1819a, 108, 400–401, 779 (in Apogon ruber =Mullus imberbis; Naples).—Cobbold, 1860a, 27.—Dies., 1850a, 370.—Duj., 1845a, 422 to (Apoblema).—Mont., 1891, 522.—Stoss., 1886, 45.—Wagener, 1860, 189 (in Mullus imberbe).

apiculatum (Rud., 1803) Rud., 1809a, 423, to (Echinost.) includes D. stridulæ, 1801 (in Strix stridula, S. flammea); 1819a, 116, 119.—Braun, 1893a, 874.—Cobbold, 1860a, 35 (to Echinost.) (in Strix aluco, S. flammea).—Crep., 1837, 311.—Dies., 1850a, 386 (in Strix aluco, S. flammea; Gryphiæ).—Duj., 1845a, 425–426.—Giebel, 1857, 266.—Looss, 1899, 703.—Olfers, 1816, 46.—Stoss., 1892, 173 (to Echinost.).

apodis Packard, 1882, 142, fig. 1 (in egg sacks of Apus).

apolaimum Heymann, 1905, Mar. 25, 91–94, pl. 6, figs. 4–5 (in Kachuga tectum (Gray), small intestine); *λαιμός*, Schlund.

appendiculata Leidy, 1877, 202 (in Helix arborea) [nec Rud., 1802]; 1891a, 416 (syn. of D. centrappendiculatum).

appendiculatum (Rud., 1802) Rud., 1808a, xxiv [descr. of pls.], pl. 5, fig. 2 [nec Frœlich, 1802]: 1809a, 387, 400–401, 405, 407, 438, pl. 5, fig. 2; 1819a, 110, 122, 404–406.—Baird, 1853a, 54.—Bellingham, 1844a, 425.—Ben., 1858a, 1861a, 178, 189; 1870, 16, 30, 66.—Braun, 1891d, 423 to (Apoblema); 1892a, 705; 1893a, 853, 864, 879, 911; 1893d, 468; 1902b, 124.—Cobbold, 1858b, 158; 1860a, 20.—Crep., 1837, 310, 313, 326; 1839a, 288.—Dies., 1850a, 342, 370–371, 398 (includes Apoblema ap. Bl., Fasc. alosæ Hermann, F. clupeæ Schrank, F. ap. Rud., F. crenata Rud., Dist. clupeæ Zed., D. clupeæ rhenanæ Rud., D. crenatum Rud., D. varium Eysenhardt); 1858d, 268 (larva Histrionella echinocerca Dies.); 1858e, 342 (in Acipenser sturio, Ammodytes lancea); 1859c, 431–432.—Duj., 1845a, 420–421 to (Apoblema).—Fil., 1855b, 19.—Fraip., 1880b, 106; 1881b, 4.—Gamb., 1896a, 71.—Hausmann, 1897b, 4, 6, 20, 22, 38–39, pl. 1, figs. 11–12 (in Trutta salar).—Johnstone, 1907, 180–182, fig. 14 (in Gadus merlangus; Shoals).—Juel, 1889, 4, 7.—Kroyer, 1838–

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1840a, 187, 578, 582, 583, 595, 605, 609, 611; 1843–1845a, 444, 488, 581; 1846–1853a, 218, 253, 641; 1852–1853a, 778, 1219 (in Gasterosteus aculeatus L., Perca fluviatilis Linn., Trigla hirundo Linn., Cottus scorpius Linn., Scomber scombrus Linn., Gadus morrhua Linn., Lota vulgaris Cuv., Platessa flesus Linn., Rhombus maximus Linn., Solea vulgaris Cuv., Salmo salar Linn., Alosa finta Cuv., Esox lucius Linn., Anguilla migratoria Kroyer, Acipenser sturio Linn., Clupea harengus Linn.)—Lander, 1904a, 14, to (Hemiurus).—Leuck., 1863a, 453, 454, 481.—Levin., 1881a, 9, 58–59, 59 (Rud. of Olsson, 46, syn. of D. a. Rud. Mol.), 61, 64 (includes D. ventricosum Wagener, D. ap. Rud.of Olsson) (in Cottus scorpius, Gadus ovak).—Linst., 1903, 354.—Lint., 1900, 269, 283, 289, pl. 36, figs. 25–26; 1901, 408, 415, 418, 437, 439, 440, 445, 449, 459, 460, 467, 471, 475, 478, 482, 486, 487, figs. 312–314; 1905, 328, 333, 352, 365, 374, 378, 382, 393, 404, 405, 415, figs. 152, 153, 160 (in Brevoortia tyrannus, Caranx hippos, Coryphæna equisetis, Lagodon rhomboides, Leiostomus xanthurus, Lophopsetta maculata, Orthopristis chrysopterus, Prionotus scitulus, P. tribulus).—Looss, 1894a, 204; 1899b, 640 (type of Hemiurus).—Luehe, 1901n, 394, 396, 397, 398, 399, 401.—Mayer, 1841a, 17–18, pl. 3, fig. 12.—Mol., 1858, 289 (in Alausa vulgaris; Patavii); 1859, 825–826 (in Anguilla vulgaris; Padua); 1861, 204–205, pl. 2, fig. 3.—Mont., 1888, 17, 38, 43; 1888a, 198; 1891, 9 (to Apoblema); 1891, 496, 497, 498, 499, 500, 501, 502, 522 (to Apoblema); 1893, 123.—Nicoll, 1906, 525.—Olfers, 1816, 46.—Olss., 1868, 46; 1876, 20; 1893, 11.—Sieb., 1842, 365.—Staff., 1902, 895.—Stiles & Hass., 1898a, 90.—Stoss., 1883, 115; 1885, 159; 1886, 47; 1886, 13; 1887, 90; 1887, 184; 1890, 40; 1902, 582.—Wagener, 1860, v. 1, 165–190, pls. 8–9.—Will.-Suhm., 1871 (3), 25 July, 380–396.—Reported also for Acipenser sturio, Achirus fasciatus, Alausa finta, A. vulgaris, Alosa vulgaris, Anguilla vulgaris, Brosmius brosme, Capros aper, Centropages hamatus, Citharus linguatula, Clupanodon pseudohispanicus, Clupea alosa, C. sprattus, Coregonus oxyrrhynchus, Cottus bubalis, Cynoscion regalis, Decapterus macarellus, Gadus æglefinus, G. callarias, G. euxinus, G. melanostomus, G. minutus, G. morrhua, G. ovak, G. polachius, G. virens, Gobius jozo, Hippoglossus maximus, Labrax lupus, Lichia amia, Lophius piscatorius, Lota molva, Lucullus acuspes, Merlangus pollachius, M. vulgaris, Microgadus tomcod, Molva vulgaris, Myxocephalus æneus, Paralichthys dentatus, Pomolobus mediocris, P. pseudoharengus, Prionotus carolinus, Pseudopleuronectes americanus, Saurus griseus, S. lacerta, S. saurus, Stenotomus chrysops, Stotenophorus brownii, Torpedo marmorata, Trachurops crumenophthalmus, Urophycis chuss.

appendiculatum Rud., 1819a, 404, e. p.—Odhn., 1905, 352 (syn. of Brachyphallus crenatus).

appendiculatum Rud. of Olss., 1868.—Levin., 1881, 59 (p. 46 Olss., syn. of D. a., Rud. of Mol.).—Odhn., 1905, 348 (syn. of Hemiurus levinseni; includes D. a. "(e. p. ?) Levin., 1881, 58"), 351 (Olss., 1868, pl. 5, fig. 95, syn. of Hemiurus communis Odhn.; includes also D. a. Juel, 1889), 352 (Olss., 1868, e. p., syn. of Hemiurus lühei Odhn.).

aquilæ Leidy, 1887b, 24 (in Haliaëtos leucocephalus); 1904a, 197.—Braun, 1893a, 876; 1900h, 16, 42.—MacCallum, 1899, 706, 707.—Stiles & Hass., 1894, 414.

arcanum Nickerson, 1900, Oct., 811–815, fig. 1 (in frogs).—Staff., 1902, 482, to (Pleurogenes) (includes D. medians Olss., of Staff., 1900); 1902, 724; 1905, Apr. 11, 683 (type of Loxogenes).

arcuatum Duj., 1845a, 410–411 (in Corvus glandarius; Rennes) to (Brachylaimus).—Braun, 1901e, 341.—Cobbold, 1860a, 15.—Dies., 1850a, 389.—Looss, 1899b, 703.—Stoss., 1892, 151.—Wolffhuegel, 1900, 9, 24, 37, 38, 39, 40, 41, 42.—Reported also for Corvus corone, Garrulus glandarius.

ardeæ (Gmelin, 1790) Zed., 1803a, 222.—Dies., 1850a, 388 (syn. of D. ferox Zed.).—Rud., 1809a, 432.

ardeæ minutæ Pontallié (1853), to (Cladocalium).—Dies., 1855, 64, foot-note 5, to (Cladocalium).

ardeæ nigræ Viborg, 1795, see Rud., 1809a, index (D. hians Rud.).

ardeæ stellaris Rud., 1809a, 432–433 (Fasc. ardeæ Gmelin, 1790, renamed); 1819a, 120. Dies., 1850a, 388 (syn. of D. ferox Zed.).—Duj., 1845a, 447.—Stoss., 1892, 165, syn. of Echinost. ferox (Rud.).

arcuula Crep., 1825a, 53–54 (in Fulica atra); 1837, 317.—Braun, 1902b, 155, 156, *157, fig. 99.* Cobbold, 1860a, 15.—Dies., 1850a, 364–365.—Duj., 1845a, 447.—*Linst., 1887,* 104.—Stoss., 1892, 177.

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areolatum Rud., 1809a, 50, 401–402 (Fasc. platessæ Mueller, D. platessæ Zed.) (in Pleuronectes platessa); 1819a, 111, 408–409.—Carus, 1884, 126.—Cobbold, 1860a, 26.—Dies., 1850a, 352 (Fasc. platessæ Mueller, 52, pl. 78, figs. 1–5; D. platessæ Zed.).—Duj., 1845a, 467.—Kroyer, 1843–1845a, 275 (in Platessa vulgaris Cuv.).—Lint., 1900, 269, 279, 293–294, pl. 39, figs. 60–63; 1901, 415 (in Morone americana, Pseudopleuronectes americanus, Tautogolabrus adspersus), 422, 456, 462, 486; 1905, 328, 334, 379, 389, 391, 396 (in Bairdiella chrysura, Micropogon undulatus, Orthopristis chrysopterus, Sciænops ocellatus).—Mont., 1893, 193.—Olfers, 1816, 46.—Stoss., 1886, 43, 60 to (Echinost.).—Wagener, 1860, 185.

aristotelis Stoss., 1892, 14–15 (D. chilostomum Mehlis of Ben., 1873b) (in Rhinolophus hippocrepis, Vespertilio murinus, V. desyeneme, V. daubentonii, V. emarginatus, V. mystacinus, Nannugo pipistrellus).—[Ben., 1873, 27.]—Braun, 1900, 221, 223, 388.—Stoss., 1892, 14, to (Brachylaimus).

armatissimum Linst., 1903, 280, fig. 15 (in Iguana sp.).

armatum (Rud., 1793) Zed., 1803a, 220.—Caruccio, 1886, 293.—Dies., 1850a, 382 (syn. of D. trigonocephalum Rud.).—Rud., 1809a, 416.—Stoss., 1892, 167 (Echinost. echinatum (Zed.) Cobbold).

armatum Mol., 1858, 130 [nec (Rud., 1793) Zed., 1803] (in Phasianus gallus; Patavii); 1861, 217.—Anacker, 1887c, 513 (in Gallus dom.).—Braun, 1893a, 874 (in Gallus dom.).—Dies., 1858c, 347.—Hass., 1896a, 2, 3 (syn. of Echinost. echinatum (Zed.).—Landois, 1882, 23.—Schneidemuehl, 1896, 303 (in chickens).—Sons., 1889, 11 (in Gallina).—Stoss., 1898, 52.

armatum MacCallum, 1895, 401 (as variety of D. isoporum).

armatum paludinæ impuræ Fil., 1857c, pl. 2, figs. 14, 15 [doubtless equals D. paludinæ impuræ armatum].

arrectum Duj., 1845a, 403 (in Lézard vert), to (Brachycœlium).—Cobbold, 1860a, 20.—Dies., 1850a, 389–390 (in Lacerta viridis; Rhedoni).—Linst., 1873, 101; 1879, 185.—Looss, 1899b, 567, 568, 611, 614; 1902m, 816.—Luehe, 1899k, 536.—Mol., 1859, 831–833 (in Lacerta viridis, Rhedoni; Podarcis muralis, Padua).—Par., 1894, 147.—Stiles, 1901r, 197, 199, 201.—Stoss., 1895, 225–226.—Also reported for Lacerta muralis.

arrectum of Mol. [1859, 831–833], and of Stoss. [1895, 225–226], are, according to Looss, 1899b, 567–568, probably misdeterminations. Molin's form apparently belongs in Telorchis.—Braun, 1901a, 13.—Luehe, 1899, 530.

ascidia Rud., 1819a, 108, 399–400 [nec Ben., 1873] (in Sparus boops, S. pagrus; Arimini and Naples).—Barbagallo & Drago, 1903, 410, to (Brachylaimus) (in Box boops, Pagrus vulgaris; Catania).—Carus, 1884, 130.—Dies., 1850a, 369 (in Box vulgaris, Pagrus vulg.; Armini and Naples).—Duj., 1845a, 458.—Looss, 1899b, 609.—Stoss., 1886, 45; 1898, 41.

ascidia Ben., 1873c, 328–329 (see D. lagena Brand.) [nec Rud., 1819a].—Brand., 1889b, 249, 250.—Braun, 1892a, 577, 618, 642, 663; 1893a, 864; 1900, 388; 1900b, 221, 223, 224, 225.—Cobbold, 1879b, 294.—Gamb., 1896a, 71.—Kowal., 1894, 2.—Linst., 1884, 140, fig. 25; 1885, 248–249; 1887, 102–103, pl. 2, figs. 4, 17f (in Vesperugo nathusii) (includes Cerc. armata Sieb.).—Looss, 1894a, 2, 125, 127, 167, 168, 181, 184, 185, 186, 212, 270, 275, pl. 3, fig. 52, pl. 4, figs. 72–73; 1896b, 86; 1898, 453, 454, 455, 457, 458, fig. 1, ii; 1899, 547, 556, 609 (type of Lecithodendrium), 610, 613, 618, 718.—Luehe, 1899, 536.—Macé, 1881, 421, in Vespertilio murinus; 1882, 62.—Stiles, 1901r, 200.—Stoss., 1892, 21 (in Plecotus auritus, Rhinolophus hippocrepis, Vespertilio dasycneme, V. daubentonii, V. murinus, V. mystacinus, Vesperugo nathusi, Vesperus serotinus, Nannugo pipistrellus).—Also reported for Rhinolophus ferrum equinum, R. hipposideros, Limnæa stagnalis, Planorbis corneus, Ephemera, Perla, Chironomus plumosus.

ascidioides Ben., 1873, 332 (in Vesperugo noctula).—R. Bl., 1891, 467.—Braun, 1892a, 579; 1893b, 185 (in Vespertilio murinus); 1900, 221, 222; 1900, 388.—Cobbold, 1879b, 294. Linst., 1885, 249–250; 1887, 103 (in Rhinolophus hipposideros).—Looss, 1894a, 2, 167, 168, 181, 182, 184, 185, 210, 211, 212, 275, pl. 3, fig. 51; 1896b, 86; 1898a, 453, 454, 455, 457, 458, fig. 1, i; 1899b, 547, 609, 610 (to Lecithodendrium).—Mont., 1892, 712.—Staff., 1902, 483 (in Vespertilio subulatus) to (Lecith.); 1905, Apr. 11, 692 (syn. of Lecith. chilostomum Mehlis).—Stiles, 1901, 200.—Stoss., 1892, 16 (in Rhinolophus hippocrepis, in Belgio; Vesperugo noctula; Vespertilio murinus; in Clarte-Dieu, Francia; Vesperus serotinus).

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ascoidea Leidy, 1877e, 201 (in Planorbis parvus) to (Gymnocephala); **1904a, 144.**—Linst., 1889a, 122 (ascoideum).

asperum Wright, 1879, 57–58, pl. 1, figs. 3–5 (in Ardea minor).—**Braun, 1892a,** 583.—Mont., 1893, 94.—Stoss., 1892, 164 (to Echinost.).

aspidophori Ben., 1870, 34, pl. 4, fig. 16 (in Aspidophorus europæus).—**Braun,** 1892a, 643.—Stoss., 1886, 45.

assula Duj., 1845a, 398 (in Coluber natrix; Toulouse) to (Dicrocœlium).—Cobbold, 1860a, 20.—Dies., 1850a, 390.—Erc., 1881e, 78; **1882a, 314** (from Tropidonoton).—Kampmann, 1894b, 454.—Linst., 1879, 184.—Mont., 1893, 187, 188, 189.—Par., ——, 147.—Stoss., 1895, 222.—Volz, 1899, 235, 237.

atomon (Rud., 1802) Rud., 1809a, 362–363 (in Pleuronectes flesus); **1810a, 328;** 1819a, 95.—Ben., 1870, 48 (D. altemon).—Braun, **1892a, 763, 764, 766; 1893a,** 873.—Carus, 1884, 132.—Cobbold, 1858b, 160–161, pl. 32, figs. 30–32 (in Hippoglossus vulgaris); 1860a, 30.—Dies., 1850a, 340 (in Platessa flesus; Gryphiæ); 1859c, 427–428.—Duj., 1845a, 466–467.—Kroyer, 1843–1845a, 297 (in Platessa flesus).—Linst., 1878, 225, fig. 7.—Mol., 1858, 288 (in Platessa passer; Patavii); 1859, 828; (in Platessa passer; Padua); 1861, 199.—Mont., 1893, 193.—Nicoll, 1907, 73 (to Podocotyle).—Odhn., 1901, 484, 485, 499, 502, 503, 506, 507, 508, 509, 511, 512, 513, 514; 1905, 320, 321 (to Podocotyle).—Olfers, 1816, 45.—Olss., 1868, 30.—Stiles & Hass., 1898a, 95.—Stoss., 1886, 33 (in Anarrhichas lupus); 1887, 185, 186; 1898, 47–48.—Wagener, 1860, 183, 188.

atriventre Weinland, 1856, 24 (in Physa heterostropha).—**Braun, 1893a, 865.**—Gamb., 1896a, 71.

attenuatum Rud., 1814a, 103, F. longicollis Abildg., renamed [later renamed naja] [nec Duj., 1845a].—Olfers, 1816, 46.

attenuatum Duj., 1845a, 392–393 [nec Rud., 1814] (in Turdus merula; Rennes) (includes ?D. longicauda Rud., ?D. macrourum Rud., ?D. albicolle Rud., ?D. clathratum Deslongchamps).—Braun, 1902b, 109.—Dies., 1850a, 345 (syn. of D. macrourum Rud.).—Rail., 1900, 240.—Schlotthauber, 1860, 129.—Stoss., 1892, 156.

attenuatum Bremser, MS., in Rhynchops nigra; Brazil.—**Braun, 1901f, 563** (renamed Microlistrum spinetum); 1902b, 60.

auriculatum Wedl, 1857, 242–243, pl. 1, fig. 2 (in Acipenser ruthenus).—**Braun,** 1892a, 586; 1900, 231.—Carus, 1884, 128.—Cobbold, 1860a, 25.—Dies., 1858e, 343.

auriculatum Wedl of Lint., 1898, 521, pl. 45, figs. 1–7 (U. S. Nat. Mus. 4845); 1901, 415, 435.—Looss, 1902, 454 (of Lint., 1898) (probably a Bunodera and identical with D. petalosum).—Staff., 1904, May 3, 491 (of Lint., as syn. of Acrodactyla petalosa Lander).—Stoss., 1886, 18, 63 to (Crossodera).—See also lintoni.

baccigerum Rud., 1819a, 108, 398–399 (in Atherina hepsetus; Naples).—**Braun,** 1892a, 700, 720, 721, 734.—Carus, 1884, 129.—Cobbold, 1860a, 27.—Dies., 1850a, 369.—Duj., 1845a, 461.—Mont., 1893, 95.—Stoss., 1886, 45; 1889, 27; 1898, 44–45.

bacillare Mol., 1859, 834–835 (in Centrolophus pompilius; Padua).—**Barbagallo & Drago, 1903, 410** (to Dicrocœlium) (in Scomber scombrus; Catania).—**Braun,** 1892a, 720, 737.—Carus, 1884, 130.—Looss, 1899b, 571 (this form, as described by Stoss., belongs to the Creadiinæ, possibly to Creadium).—**Mont., 1893, 86,** 94, 102.—Odhn., 1905, 328, 338.—Stoss., 1886, 31 to (Dicrocœlium); **1887,** 92–93; 1898, 50.

baculus Dies., 1850a, 391 (in Mergus albellus) (D. mergi Rud., **1819a, 121,** renamed).—Braun, 1892a, 584; 1893a, 911.—Cobbold, **1860a, 36, 163** (to Echinost.).—Linst., 1877, 183, pl. 13, fig. 15.—Stoss., 1892, 163.

bælzi Cobbold, 1884g, 976 (syn. of D. pulmonale Bælz).

bagri incapsulatum Wedl, 1861, 479–480, pl. 3, fig. 40 (in Bagrus sp.).

baraldii Sons., 1892, 91, 92, 93, 94 (in Zamenis viridiflavus Lacep.); **1893, 499;** 1893, 184; 1896, 116.—Braun, 1893b, 185 (in Z. vir.).—Rizzo, **1902, 28** (in Coluber viridiflavus; Catania).—Stoss., 1895, 218–219, to (Brachylaimus).—Volz, 1899, 235, 237.—West, 1896, 323.

barbatum (Linn., 1761) Zed. of Rud., 1809a, 441.—[See Dies., 1850a, 573] (syn. of Tetrabothriorhynchus migratorius).

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batryophorum Ben., 1870, 51, see botryophorum.

beleocephalum Linst., 1873, 104–105, 106, pl. 5, fig. 2 (in Ardea cinerea).—Stoss., 1892, 169 (to Echinost.).

belones Braun, 1893a, 871 (in Belone vulgaris), based on Wedl, 1855, 382–383.

belones vulgaris Dies., 1855, 64, based on Wedl, 1855, 382–383 (gives no specific name); 1858e, 355, 356 (in Belone vulgaris).—Carus, 1884, 128.—Stoss., 1886, 46.

benedeni Stoss., 1898, 51, for benedenii, 1887.

benedenii Stoss., 1887, 95, pl. 10, fig. 39 (in Mugil chelo); 1898, 51.—Braun, 1891d, 424; 1892a, 569, 698, 720.—Looss, 1894, 178; 1901, 439; 1902, 129, 130, 136, 137.—Mont., 1893, 82.—Sons., 1894, 254, 255.—[Type of Haploporus 1902.]

bergense Olss., 1868, 43–44, pl. 10, fig. 93 (in Anguilla vulgaris).—Ben., 1870, 83 (bergensis).—Odhn., 1905, 356, 357 (syn. of Lecithaster gibbosus (Rud.)).—Stoss., 1886, 24 to (Brachylaimus); 1902, 582.

bergensis Ben., 1870, 83, for D. bergense.

beroës Will., 1844, 343–344, pl. 10, figs. 10–13 (in Beroe rufescens; Triest).—Busch, 1851, 99 (in Saggita; Triest).—Dies., 1850a, 381 (renamed D. papillosum).—Mont., 1893, 123.—J. Mueller, 1850, 497.—Pag., 1862, 298.

betencourti Mont., 1893, 33, 34, 35, 43, 52, 84, 85, 88, 91, 95, 96, 102, 106, 107, 114, 146, 171, 186, 190–193 (syns. D. luteum of Ben., 1870, 3; Stoss., 1886, 52; Mont., 1890, 432) (in Scyllium; Boulogne), pl. 8, fig. 121; 1896, 152.—Ariola, 1899, 8 (D. luteum Ben. as syn.).—Linst., 1903, 354.—Looss, 1894, 219; 1899b, 622.—Stoss., 1899, 10 (to Pleurogenes; syn. luteum Ben., in Scyllium canicula, S. stellare at Boulogne); 1904, 193–197.

bicoronatum Stoss., 1883, 113–114, pl. 1, figs. 1–3 (in Ciconia nigra); 1886, 34, 113 to (Echinost.); 1887, 186; 1890, 42 (=D. cesticillus Mol.); 1892, 64; 1898, 54.—Braun, 1892a, 571, 583; 1893a, 911; 1893b, 184 (in Zeus faber).—Carus, 1884, 127.—Looss, 1901, 599, 600.—Mont., 1888a, 14; 1893, 160, 161.—Sons., 1891, 258.—[1901 to Stephanochasmus.]

bifurcatum Wedl, 1861, 477–478, pl. 3, fig. 38 (in Crocodilus vulgaris; Egypt).—Brand., 1888a, 15; 1888, 57, to Diplost.

bifurcum Braun, 1899, 631 (in Flussschildkröten); 1901b, 13, 18 (to Telorchis).—Luehe, 1899, 529 (to Telorchis).

bilharzii Herff, 1894a, 415, for Bilharzia hæmatobia.

biliosum Leidy, 1858a, 111 (in a fish; America); 1904a, 112.—Dies., 1859c, 430–431.

bilis (Braun, 1789) Zed., 1803a, 214–215 (in Falco melanaëtus; Germany).—Braun, 1892a, 632.—Dies., 1850a, 376 (in Falco chrysaëtos, F. albicilla).—Rail., 1898, 412 (to Campula).—Rud., 1809a, 408 (renamed D. crassiusculum).

bilobum Rud., 1819a, 114, 416 (in Tantalus falcinellus; Mus. Vien.) to (Echinost.).—Braun, 1892a, 584.—Dies., 1850a, 385; 1858e, 347 (in Ibis falcinellus, Platalea leucorodia, Fulica atra); 1859c, 434.—Duj., 1845a, 431–432.—Mol., 1858, 291 (in Ibis falc.; Patavia); 1861, 218–219, 247, pl. 3, figs. 5, 8.—C. Par., 1887, 332.—Stoss., 1891, 216; 1892, 171 (to Echinost.).—Wedl, 1857, 246–247, pl. 1, fig. 7.—Also reported for Plegadis falcinellus.

binode (Mueller, 1776) Zed., 1803a, 215 (in a fish).—Dies., 1850a, 379.—Rud., 1809a, 439–440; 1819a, 123.

bipartitum (Wedl, 1855) Mont., 1893, 150.—[1902 to Didymostoma.]

blanchardii Cobbold, 1860a, 8, Brachylæmus erinacei Blanchard, 1847, renamed (in Erinaceus europæus; Paris).—Stoss., 1892, 35 (syn. of D. linguæforme Dies.).

blennii (Mueller, 1776) Zed., 1803a, 211–212.—Dies., 1850a, 344 (syn. of D. divergens Rud.).—Harz, 1881c, 11.—Rud., 1809a, 371 (renamed D. divergens Rud.).

bliccæ Linst., 1877, 185–186 (in Blicca bjoerkna).—Braun, 1893a, 871.—Stoss., 1886, 46.

bolodes Braun, 1902b, 11, 17, 18, 19, 74, figs. 12–13 (in Fulica atra; Rossitten (Kurische Nehrung)).

bonnieri Mont., 1893, 40, 42, 43, 49, 61, 82, 83, 84, 85, 86, 88, 89, 90, 91, 95, 102, 180–184, pl. 1, fig. 8, pl. 6, figs. 76–80 (in Trigla gurnardus; Wimereux), syn.

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D. varicum Mueller of Mont., 1889, 492, pl. 22, fig. 20.—Looss, 1894, 170; 1899b, 641, 642 (type of Liopyge).

bosci Cobbold, 1859d, 364, pl. 63, figs. 6–7 (includes Fasc. colubri Bosc, Dist. colubri americani Rud.) (in Coluber sp.); 1860a, 19; 1861e, 119; 1864, 22; 1879b, 455 (boscii).—Braun, 1893a, 872, 876 (boscii).—Staff., 1905, Apr. 11, 692 (belongs to Zeugorchis).—Stoss., 1895, 226.—Volz, 1899, 235, 238.—West, 1896, 322.

boscii Cobbold, 1879b, 455, for bosci, q. v.—Sons., 1892, 92.

bothryophoron Braun, 1892a, 700, for botryophoron.

botryophoron Olss., 1868, 42–43, fig. 92 (in Cyclopterus).—Ben., 1870, 51 (batryophoron).—Braun, 1889a, 367; 1892a, 643, 700 (bothryophoron), 721.—Lint., 1901, 415 (in Clupea harengus, Pomolobus pseudoharengus), 419, 437, 439, 444, 485, figs. 355, 356 (bothryophoron); 1905, 328, 334, 378, 397, 411, figs. 174–175 (bothryophoron) (in Micropogon undulatus, Orthopristis chrysopterus, Paralichthys dentatus).—Looss, 1899b, 729 (bothryophoron) (to Hemiurus).—Odhn., 1905, 356 (syn. of Lecithaster gibbosus (Rud.)), 359 (type of Lecithophyllum).—Stoss., 1886, 21 (in Cyclopterus lumpus, Argentina silus, Molva abyssorum); 1896, 128 (bothryophoron); 1898, 40 (both.).

brachysomum Crep., 1837a, 314 (in Hæmatopus ostralegus); 1846, 134, 136, 142; 1849a, 1, 68.—Braun, 1892a, 578, 583, 710, 720, 721, 723, 728, 733, 736; 1893a, 865, 874, 879; 1900, 234; 1902b, 155.—Cobbold, 1879b, 438.—Dies., 1850a, 397; 1858c, 354 (in Hæmatopus ostralegus).—Gamb., 1896a, 71.—Jægers., 1898, 14; 1900, 738, 739; 1901, 982 (type of Levinsenia).—Linst., 1878, 133 (in Hæmatopus ost.), 136 (in Ægialites hiaticula), 142 (in Ardea cinerea); 1882, 20–21; 1887, 104; 1889, 48 (in Tringa alpina), 50 (in Æg. hiat.), 55 (in Fuligula cristata), 56 (in Glaucion clangula); 1894b, 336 (in Actitis hypoleucus; Seeburger See).—Looss, 1894a, 175; 1899b, 620, 621, 622 (? type of Levinsenia); 1901b, 207; 1902m, 703, 704, 705, 706 (type of Levinsenia according to Luehe), 826.—Luehe, 1899k, 537, 538.—Mont., 1888, 94; 1893, 43, 83, 86, 95, 102.—Nicoll, 1906, 524.—Odhn., 1900, 13; 1905, 317.—Stiles & Hass., 1902d, 20 (type of Levinseniella).—Stoss., 1892, 148 (includes D. calidris Rud.).—Villot, 1875, 475, 476; 1878, 22–24 (in Anas glacialis, Ardea cinerea), 27, 28, pl. 5, fig. 7 (in Strepsilas interpres, Tringa variabilis).—Ward, 1901, 176, 184 (type of Levinsenia Stoss.).—Also reported for Actitis hypoleucus, Anthura gracilis, Bucephala clangula, Charadrius calidris, C. hiaticula, Harelda glacialis.

bramæ (Mueller, 1776) Zed., 1803a, 218.—Dies., 1850a, 341 (syn. of D. globiporum Rud.).—Harz, 1881c, 11.—Rud., 1809a, 365.

brevicolle Crep., 1829b, 54–55 (in Hæmatopus ostralegus; Greifswald).—Braun, 1901, 944; 1902b, 11, 12 (to Psilost.), 14, 15, 23, 26.—Cobbold, 1859d, 364; 1860a, 14.—Dies., 1850a, 363–364.—Duj., 1845a, 445.—Linst., 1887, 104.—Mehlis, 1831, col. 176.—Mueller, 1897, 19, pl. 3, fig. 2.—Nicoll, 1906, 514 (in Hæm. ostr.).—Stoss., 1892, 35 D. (Dicrocœlium), 177.

brusinæ Stoss., 1889, 25–26, pl. 14, fig. 60 (in Oblata melanura; Triest); 1898, 32; [1904, 197 (type of Diphtherost.)].—Braun, 1892a, 587, 700, 736; 1893a, 874, 910.—Looss, 1899b, 622, 623, to Pleurogenes.—Mont., 1893, 85, 86, 102.

brusinai Looss, 1901d, 399, for brusinæ (in Labrus merula, L. maculata, Crenilabrus pavo, C. griseus, C. quinquemaculatus), 400–401; 1902h, 129.—Barbagallo & Drago, 1903, 410 to (Brachycœcum) (in Oblata melanura; Catania).—Stoss., 1904, 195, 196, 197 (type of Diphtherost.).

buccini Fil., 1855b, 23.

buccini mutabilis Fil., 1855b, 17, pl. 2, figs. 17–18 (in Buccinum mutabile; Gulf of Gênes); 1857b, 433, pl. 2, figs. 17–18.—Dies., 1858d, 266 to Cerc. (Acanthocephala)).—Par., 1894, 160.—Villot, 1875, 479.

bufonis Linst., 1877, 185 (in Bufo vulgaris).—Braun, 1893a, 870.—Stoss., 1889, 69.

bursæ fabricius Podwyssozki, 1890, 157 (in Gallus domesticus).

bursicola Crep., 1837, 310, 311, 313 (in Ardea cinerea); 1846, 134.—Braun, 1893a, 876; 1893d, 467 (in A. cin.); 1901, 259 (syn. of Echinost. cloacinum Braun) (types in Creplin's collection, Zool. Museum, Greifswald); 1902b, 74.—Dies., 1850a, 397.—Hass., 1896a, 2 (syn. of Cephalogonimus ovatus (Rud.)).—Stiles, 1901k, 593; 1901l.—Stoss., 1892, 144 (syn. of Cephalog. ov. (Rud.) Stoss.); 1898, 23 (syn. of Cephalog. ov.).

buski Bl., 1888, 622–625, for D. buskii, q. v.

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buskii Lankester, E., 1857b, 437 (in Homo; from Asia).—Aitken, 1866, 804, syn. of D. crassum (Busk).—Bl., 1888a, 622 (includes D. crassum Busk, 1859 [nec Sieb., 1836], 623–625; 1891, 610 (buski) (syn. D. rathouisi Poir.).—Braun, 1895b, 141 (includes D. crassum); 1889a, 348; 1902b, 95; 1903, 3 ed., 153 (to Fasciolopsis); 1906, 159, 160, fig. 90 (buski).—Brunet, 1902a, 125 (buski).—Cobbold, 1858b, 167; 1860a, 5; 1866, 6; 1876, 303; 1879b, 20.—Gamb., 1896a, 63.—Huber, 1896a, 575–576.—Ijima, 1889, 131.—Kholodk., 1898, 26.—Leuck., 1863a, 587.—Linst., 1878, 3 (syn. of D. crassum).—Looss, 1899b, 557 (see Fasciolopsis).—Moniez, 1896, 86, 114–117, 118.—Rail., 1893a, 363, to (Dicrocœlium).—Simon, 1897, 209, 223.—Tyson, 1903, 3 ed., 1180.—Ward, 1895, 328 (in Homo); 1903, 867 (to Fasciolopsis); 1904, v. 39, 260.—Weinland, 1858, to Dicrocœlium.—Wood, 1904, v. 39, 260.

buteonis (Gmelin, 1790) Zed., 1803a, 221.—Dies., 1850a, 396 (in Falco buteo).—Duj., 1845a, 442.—Rud., 1809a, 430; 1819a, 119.—Stoss., 1892, 178.

[*cæruleum* Sluiter, 1898, 4, 9, 14–16, pl. 2, fig. 4; pl. 3, fig. 11 (a tunicate).]

cahirinum Looss, 1896, 119–121, pl. 8, figs. 83–84 (in Bagrus bayad; Cairo); 1899, 752 (to Haplorchis).

calvolus Mol., 1858, 129 (in Conger conger, at Patavii); 1861, 210–211.—Braun, 1892a, 586.—Carus, 1884, 132.—Cobbold, 1860a, 25.—Dies., 1858, 342.—Stoss., 1886, 28 to (Dicrocœlium).

calidris Rud., 1819a, 120 (in Scolopax calidris).—Dies., 1850a, 323 (syn. of Monost. mutabile Zed.).—Duj., 1845a, 447.—Stoss., 1892, 148 (syn. of D. brachysomum Crep., 1846).

callionymi Ben., 1870, 53, pl. 4, fig. 8 (in Calliomynus dracunculus).—Stoss., 1886, 46.

calyptrocotyle Mont., 1891, 110; 1892, Oct. 7, 172, 176; 1893, 1–138, 171, 175, to (Accacœlium), pl. 1, fig. 14; pl. 2, figs. 1–11; pl. 3, figs. 12–15, 17–21, 24–28, 30, 31; pl. 4, fig. 50; pl. 7, fig. 104; pl. 8, fig. 136 (in Beroë ovata Dch.); 1896, 151, 152.—Darr, 1902, 688.—Looss, 1894, 131, 142, 145, 165, 166, 189, 219; 1902, 639 (to Orophocotyle).

campannlatum Rivolta, 1884, 27, for campanulatum.

campanula Duj., 1845a, 435 (in Esox lucius; Rennes) to (Crossodera).—Cobbold, 1860a, 32 (=D. nodulosum).—Dies., 1850a, 381 (syn. of D. nod. Zed.); 1858e, 354; 1859c, 435, 436 (cf. Gasterost. fimbriatum Sieb.).—Kroyer, 1846–53a, 253; 1852–53a, 1221.—Moul., 1856a, 219 (in Cyprinus idus; Rennes).—Stoss., 1886, 42, to (Echinost.).—Tennent, 1906, 638 (syn. of Gasterost. fimb. Wag.) (in Esox).—Wagener, 1858, v. 1, 250, pl. 9; 1860, 165 (syn. of Gasterost. fimb.).—Wedl, 1857, 233–244, pl. 1, fig. 3.—Ziegler, 1883, 538 (in Cyprinus idus).

campanula Linst., 1886a, 125, for D. campula Cobbold.—Stoss., 1892, 16 (syn. of D. oblongum (Cobbold) Stoss.; includes Campula oblonga Cobbold, 1858), (in Phocæna communis at Warnemünde; and Platanista gangeticum Cuv.).

campanulatum Erc., 1874, 432–439, pl. 1, fig. 7 (in Canis familiaris); 1875b, —; 1875c, —; 1875d, —; 1875e, —, 39–40 (in Canis domesticus); 1875f, 278; 1875g, —; 1876a, —.—Braun, 1893a, 875; 1893e, 348, 349, 351; 1893f, 386, 387, 389, 424 (=D. truncatum Rud.); 1893g, 802, 803.—Cobbold, 1879b, 300.—Jong, 1887a, in dog; 1887b, 223–224 in cat; 1890a, 140; 1896a, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, fig. 2.—Rail., 1890, 131 (in cat).—Schneidemuehl, 1896, 302 (kampanulatum).—Sons., 1889, 276, 277, 280, 281 (syn. of D. conus Crep.).—Ward, 1895, 341.—Zwaardemaker (1887), 265; 1888, 679.—Zuern, 1882, 220.

campula Cobbold, 1876q, 40, pl. 10, fig. 2, Campula oblonga renamed; 1879b, 418, 419, 423, fig. 68.—Braun, 1900g, 250.—Hoyle, 1890, 537.—Jackson, 1888, 648.—Looss, 1899, 558, 559, 560.—Mont., 1893, 44, 82.—Stiles, 1901r, 203.—Stiles & Hass., 1899, 102.—Stoss., 1892, 16 (syn. of D. oblongum Cobbold).

canaliculatum Rud., 1819a, 676 (in Sterna sp.=galericulata teste Dies.; Brazil).—Braun, 1901f, 561, 562; 1901g, 947; 1902b, 59, 140, 142, 144 (to Bilharziella).—Dies., 1850a, 346 (in Sterna galericulata).—Duj., 1845a, 449.—Stoss., 1892, 36, 178.

canaliculatum Mehlis, in Crep., 1846, 138 (in Colymbus cristatus).

capense Harley, 1864a, 55–72, figs. 1–16 (in Homo; Cape of Good Hope); 1864b, 173–175; 1864c, 156–157; 1864d, 161–163; 1864e, 515–517; 1864f, 142–143; 1864g, 302; 1864h, 293; 1865a, 68.—R. Bl., 1888a, 636 (syn. of Bilharzia hæmatobia).—Bourel-Roncière, 1888a, 130 (capensis).—Braun, 1903, 3 ed., 1[illegible].—

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Chassaniol & Guyot, 1878a, 66.—Cobbold, 1864g, 157; 1879b, 39; 1885a, 499 (syn. of Bilh. hæm.).—Colloridi, 1891a, 856 (syn. of B. hæm.).—Almeida Couto, 1872, 4.—Crevaux, 1874a, 173 (capensis).—Duffek, 1902a, 774.—Hoyle, 1890, 538.—Huber, 1896a, 580 (syn. of Bilh. hæm.).—Leuck., 1876, v. 2 (3), 873.—Simon, 1897, 99.—Stiles, 1898a, 58.—Ward, 1895, 253 (syn. of Gynæcophorus hæm.) (in Homo).

capitellatum Rud., 1819a, 99, 379–380 (in Uranoscopus scaber; Arimini, Naples).—Braun, 1883a, 41; 1892a, 672; 1893a, 875.—Carus, 1884, 131.—Cobbold, 1860a, 26.—Dies., 1850a, 356–357.—Duj., 1845a, 456.—Jacoby, 1900, 2.—Looss, 1901, 656, 658.—Luehe, 1900, 504, 506.—Mont., 1888a, 17; 1893, 18, 32, 40, 41, 42, 43, 65, 66, 83, 84, 85, 95, 97, 102, 173–176, pl. 1, fig. 13, pl. 6, figs. 69–75, pl. 7, fig. 103.—Sons., 1890, 142 (in Uran. sc. L.).—Stoss., 1886, 46; 1886, 47; 1892, 64; 1898, 38–39.—Will.-Suhm, 1870, 8; 1871, 182.

capsulare Dies., 1858e, 355, based on Wedl, 1857, v. 26, 247, pl. 1, fig. 8 (in Ardea purpurea, A. nycticorax, A. cinerea, Gallinula crex, Podiceps nigricollis).—Braun, 1893a, 870.—Stoss., 1892, 176 (to Agamodist.).

carinariæ della Chiaje (1841a), 139, pl. 109, figs. 29–30.—Carus, 1884, 133.—Mont., 1888a, 195, 196.

carinatum Zed., 1803a, 217 (in Cyprinus; Perca fluviatilis) (includes Fasc. longicollis, Dist. cyprinaceum, F. lagena, F. jesis).—Dies., 1850a, 341 (syn. of D. globiporum), 365 (pars, syn. of D. inflexum).—Looss., 1902, 763 (and Sphærost. globiporum).—Rud., 1809a, 365 (=D. globiporum), 366, 395(pars =D. inflexum).—Stiles, 1901, 168.

carnosum (Hass., 1891) Leuck., 1892b, 798.—Braun, 1892a, 674; 1892, 563, Dist. (Fasc.) carnosa.

carnosum Rud., 1819a, 93, 366, 676 (in Sparus dentex; Naples).—Carus, 1884, 130.—Cobbold, 1860a, 22.—Dies., 1850a, 337 (in Dentex vulgaris).—Duj., 1745a, 458.—Mol., 1859, 833 (in Dentex vulgaris; Padua).—Stoss., 1885, 161; 1886, 23; 1898, 39; 1886, 59, to (Brachylaimus).—Also reported for Corvina nigra.

carolinæ Stoss., 1889, 26–27, pl. 13, fig. 55 (in Alausa finta; Triest); 1898, 29.—Braun, 1891d, 423.—Looss, 1899b, 641 (=Pronopyge ocreata).—Mont., 1891, 17 (syn. of Apoblema ocreatum); 1891, 510, 512 (syn. of Ap. ocr. Rud.).—Also reported for Alosa vulgaris.

caryocatactis Zed., 1800a, 163, 168–169 (in Corvus caryocatactes); 1803a, 210.—Braun, 1901, 562; 1902b, 123, 125 (syn. of Harmost. caudale).—Dies., 1850a, 362 (syn. of Dist. caudale).—Rud., 1809a, 382.

caterrarium Looss, 1896, 118–119, pl. 8, figs. 81–82 (in Alosa finta; Cairo).

caudale Rud., 1809a, 382–384 (caryocatactis Zed., renamed) (in Corvus caryocatactes); 1819a, 103.—Braun, 1893a, 874; 1901, 561, 562, 564; 1902b, 123, 124 (to Harmost.), 125 (of Mueller, 1897, 16=Urogonimus macrostomus); 1902b, 128 (of Rud., 1809=Harmost. mesostomum).—Cobbold, 1860a, 14.—Crep., 1837, 317; 1846, ——.—Dies., 1850a, 362.- Duj., 1845a, 442.—Giebel, 1857, 266.- Leuck., 1863a, 477.- Looss, 1899b, 703.- Mont., 1893, 149.—Mueh., 1898, 99; 1898, 16.—Mueller, 1897, 16–17, pl. 2, fig. 7.—Olfers, 1816, 44.—Sieb., 1836, 234.—Stoss., 1892, 178.—Reported also for Ampelis garrulus, Coracias garrula, Corvus glandarius, C. pyrrhocorax.

caudale of Mueller, 1897, in Coracias garrula.—Braun, 1902b, 125 (syn. of Urogonimus macrostomus).

caudale of Will.-Suhm, 1870, 97 (in Pyrrhocorax alpinus).—Braun, 1902b, 124–125 (nec Rud.).

caudatum Polonio, 1859.—Par., 1894, 147 (in Natrix torquata, Tropidonotus viperinus; Padua), 627; 1896, 9 11, fig. 4, to (Opisthorchis).

caudatum Linst., 1873, 103–104, pl. 5, fig. 3 (in Erinaceus europæus); 1900, 85 (claims priority for caudatum over leptostomum).—Blochmann, 1892b, 649–652 (raised experimentally from a Cercariæum in kidney of Helix hortensis).—Braun, 1892a, 570, 723; 1893a, 831, 856, 857; 1901e, 338 (=D. leptostomum Olss.).—Cobbold, 1879, 295.—Gamb., 1896a, 71.—Hofmann, 1899a, 189, 196, 201.—Looss, 1894, 2, 236; 1899b, 652 (to Heterolope).—Mont., 1893, 149.- Roewer, 1906, 185.—Stoss., 1892, 17 (syn. of D. leptostomum Olss.); 1898, 24.

caudatum (Bosc, 1802) Steenstrup, 1859, 183.

caudiporum Rud., 1819a, 96, 370 (in Zeus faber; Arimini). Dies., 1850a, 342, 371.—Duj., 1845a, 422 to ? (Apoblema).—Wagener, 1860, 181 (in Zeus faber).

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caviæ Sons., 1890, 100 (in Cavia cobaya); 1897, 250.—Braun, 1903, 3 ed., 147 (syn. of Fasc. hepatica); 1906, 150, fig. 83.—Rail., 1893a, 342 (syn. of Fasc. hep.).—Stiles, 1898a, 48.—Stoss., 1892, 7 (syn. of Cladocœlium hep.).—Ward, 1895, 246 (syn. of Fasc. hep.), 328 (in Homo), 332 (in Bos taurus), 335 (in Ovis aries); 1903, 865 (syn. of Fasc. hep.).

centra appendiculatum Leidy, 1904a, 277, misprint for centrappendiculatum.

centrappendiculatum Leidy, 1891a, 416 (D. appendiculata Leidy, 1877, not Rud., renamed); 1904a, 237.

cercatum Mont., 1893, 40, 42, 43, 83, 95, 102, 157, host and locality not known, specimen in British Museum, to (Urogonimus).

cerebrale Yamagiwa, 1890, 457 (in Homo), for D. pulmonum, see Paragonimus westermanii.

cesti veneris Vogt, ——, 299 (in Cestum veneris).—Braun, 1893a, 852.—Dies., 1858e, 356 (in Cestum veneris).—Mont., 1893, 124.

cesticillus Mol., 1858, 131 (in Lophius piscatorius; Patavii); 1861,——.—Braun, 1883a, 41; 1892a, 584, 672; 1901a, 34.—Carus, 1884, 127.—Dies., 1858e, 351–352.—Jacoby, 1900, 2.—Linst., 1903, 354.—Looss, 1899, 576 (type of Stephanost.), 581; 1901, 600.—Luehe, 1900, 505.—Mol., 1861, 221–223.—Mont., 1893, 41, 42, 61 (cesticillum), 160, 161.—Stoss., 1886, 34; 1890, 42 (D. bicoronatum Stoss., 1883).—Will.-Suhm, 1870, 8.

cestoides Ben., 1870, 17, pl. 6, fig. 9 (in Raja batis).—Braun, 1893a, 873.—Linst., 1903, 354.—Lint., 1901, 415, 432.—Mont., 1893, 53.—Stoss., 1886, 46.

cglindraceum Looss, 1894a, 36, misprint for cylindraceum.

charaeis Stoss., 1886, 26 to (Brachylaimus) (in Charax puntazzo; Triest); 1887, 91; 1898, 37.

chefrenianum Looss, 1896, 73–76, pl. 5, figs. 50–51 (in Rhinopoma microphyllum Geoff.; Ghizeh); 1898, 453, 454, 456, 457, 458, fig. 1 iii; 1899, 716, 717 to Lecithodendrium.—Stiles, 1901, 200.

chefresianum Looss, 1896, pl. 5 (misprint for chefrenianum).

cheloniæ atræ Braun, 1899e, 629, see D. pachyderma.

chelydræ Staff., 1900, 406–407, fig. 5 (in Chelydra serpentina); 1905, Apr. 11, 690, type of Auridist.

chilostomum Mehlis, 1831, 186–187 (in bats).—Braun, 1892a, 577; 1900, 221, 222, 223; 1900, 387, 388.—Crep., 1837, 328.—Cobbold, 1860a, 7; 1879b, 294.—Dies., 1836, 240; 1850a, 349 (includes D. noctulæ Rud., 1819a, 119).—Kolenati, 1857, 11.—Linst., 1878, 225–226, fig. 8.—Mueh., 1898, 26.—Sieb., 1836, 234.—Stoss., 1892, 20–21 (in Plecotus auritus, Vespertilio daubentonii, V. nattereri, V. murinus, V. mystacinus, Vesperugo discolor, V. leisleri, V. noctula, V. serotinus.

chilostomum Mehlis of Ben., 1873b, 27, pl. 6, figs. 7, 8, 19.—Sieb., 1835, 56.—Stoss., 1892, 14 (syn. of D. aristotelis).

chinense Cobbold, 1876, 97 (D. sinense, renamed).

chloropodis Zed., 1800a, 164, 198–199 (in Fulica chlorops).—Dies., 1850a, 384 (syn. of D. uncinatum Zed.).—Rud., 1809a, 420.

choledochum Linst., 1883a, 306–307, pl. 9, fig. 49 (in Anas sp.); 1886, 30.—Braun, 1892a, 699; 1893a, 875; 1893, 353; 1893f, 426; 1894i, 602, 605.—Looss, 1896b, 58, 59; 1899b, 675.—Stoss., 1892, 161 (in Anas sp.; Turkestan).

chrysaëti Rud., 1819a, 119 (in Falco chrysaëtus).—Duj., 1845a, 441–442.—Stoss., 1892, 151 (syn. of D. crassiusculum Rud.).

chrystallinum Hannover, 1864a, 3, for crystallinum.

cignoides Mont., 1888a, 40, 80, for cygnoides.

cimbiforme Mont., 1896, 165, for cymbiforme.

cinctum (Rud., 1803) Rud., 1809a, 422–423, to (Echinost.); 1819a, 116.—Ben., 1858a, 1861a, 85.—Cobbold, 1860a, 35, to Echinost. (in Vanellus cristatus, V. melanogaster).—Crep., 1837, 311, 312, 316.—Dies., 1850a, 386 (includes D. tringæ helveticæ Rud., Fasc. ci. Rud.) (in V. crist., V. mel.).—Duj., 1845a, 431.—Giebel, 1857, 265.—Linst., 1887, 104.—Mueller, 1897, 19–20, pl. 3, fig. 3 to (Echinost.).—Nord., 1832a, 90.—Olfers, 1816, 47.—Olss., 1876, 21.—Stoss., 1892, 172 to (Echinost.); 1898, 53.

[*circumvallata* Sluiter, 1900, 8 (a tunicate).]

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cirratum (Rud., 1802) Rud., 1808a, xxvi, pl. 6, fig. 7; 1809a, 376; 1819a, 100–101; spelled F. cirrosum, Rud., 1808a, 296.—Braun, 1893a, 874; 1901, 561, 563; 1902b, 37, 38 (syn. of D. elegans), 39, 43 (to Plagiorchis), 40, 44, 45, 47, 48, 49.—Cobbold, 1860a, 12.—Crep., 1837, 317, 322, 326.—Dies., 1850a, 350 (includes Fasc. cirrata Rud.).—Duj., 1845a, 413 to (Brachylaimus).—Fil., 1855b, 8 (cirrhatum).—Jacoby, 1900, 20.—Looss, 1899, 703.—Luehe, 1899, 530, 531; 1901, 487.—Mueh., 1896, 589; 1896, 262–266, figs. 5, 12; 1898, 16, 27, 92.—Olfers, 1816, 44.—Stoss., 1892, 153 (includes D. elegans Rud., 1819a, D. globocaudatum Duj., 1845a); 1904, 2 (to Plagiorchis).—Reported also for Ægiothus linarius, Corvus cornix, C. corone, C. monedula, C. pica, Larus marinus, Sturnus vulgaris.

cirrhatum (Rud., 1802) Fil., 1855b, 8, for cirratum.

cirrhigerum Nord., 1840, 616, for cirrigerum 1827, q. v.

cirrigerum Baer, 1827, 553 (in Astacus fluviatilis).—Brand., 1891b, 264.—Braun, 1892a, 749, 751; 1893a, 859, 870 (cirrhigerum).—Crep., 1837, 325, 326.—Dies., 1836, 240; 1850a, 363 (syn. of D. isostomum Rud.).—Harz, 1881a; 1881b; 1881c, 1, 2, 3, 4, 7, 8, 9, 10, 11, 14.—Hoyle, 1890, 537.—Jackson, 1888, 648, 652.—Kampmann, 1894b, 452, 454, 457, 458, 459, 460, 462, pl. 20, figs. 11–13.—Linst., 1903, 281, 282 (cirrhigerum); 1904, 254.—Lint., 1892, 69–70.—Looss, 1893b, 814; 1894a, 230.—Marshall & Gilbert, 1905a, 480.—Mont., 1888a, 64.—Moul., 1856, 217 (in Astacus fluviatilis).—Mueh., 1898, 14.—Nord., 1840, 616.—Reinhard, 1871, 8 pp.—Schneidemuehl, 1896, 302.—Sieb., 1835, 56, 59, 64, 67.—Steenstrup, 1842, 56.—Warren, 1903, Dec., 273–301, pls. 24–26 (anat., development); 1904, 15 June, 311.—Wierzejski, 1888, in 20 pp., 1 pl.—Zaddach, 1881, 893; 1881, 1 Aug., 398–404; 15 Aug., 423–431.

cirrosum Rud., 1808a, 296, pl. 6, fig. 2 [=7] (for D. cirratum).

cladocalium Dies., 1858e, 354 (in Ardea minuta) [based on "Distome (Cladocalium) du foie du Blongias, Pontallié, 1853, 103"].—Braun, 1893a, 875.—Stoss., 1892, 178.

clathratum Deslongchamps, in Lamouroux 1824a, 563 (in Cypselus apus).—Braun, 1893a, 875, 910; 1899, 714; 1902b, 109 (=D. refertum Mueh.).—Cobbold 1860a, 15.—Dies., 1850a, 396.—Duj., 1845a, 393–394.—Jacoby, 1900, 10, 11.—Looss, 1899, 634 (to Dicrocœlium).—Mueh., 1898, v. 1, 22, 26, 84–85, 86, 87, pl. 4, figs. 7, 17.—Olss., 1876, 24.—Stoss., 1892, 155.

clathratum Deslongchamps of Olss.—Rail., 1900, 239 (syn. of Dicrocœlium olesoni Rail.).—Braun, 1902b, 100, 109.

clava Dies., 1850a, 356 (in Eunectes scytale, Hydroscopus plumbeus, Coluber flaviventris, Clœlia fasciata: Brazil): 1855, 66, pl. 3, figs. 7–8; 1858, 339.—Braun, 1892a, 568, 587; 1901b, 13, 58; 1901i, 58.—Cobbold, 1860a, 19.—Luehe, 1899, 524, 529 (type of Telorchis); 1900b, 151.—Sons., 1892, 92.—Stoss., 1895, 229–230.

clavatum (Menzies, 1791) Rud., 1808a, 260; 1809a, 387, 391–393 (includes Hirudinella Garsin, 1730; Fasc. scombri pelamidis Tilesius), 437; 1814a, 102; 1819a, 106, 122, 394–395, 682–683, 685.—Baird, 1853a, 59, 60 includes Hirudinella clav. (Menzies) Blainv.; D. clav. Owen=H. ventricosa.—Barbagallo & Drago, 1903, 410 (in Pelamys sarda; Catania).—Ben., 1870, 37.—La Billardière, (1801), 46.—R. Bl., 1891r, 692–693, syn. D. ingens Moniez (in Requim).—Brand., 1891d, 16; 1898a, 208.—Braun, 1892a, 568, 571, 576, 588, 591, 592, 593, 597, 603, 605, 608, 609, 610, 611, 623, 624, 625, 630, 631, 632, 635, 636, 637, 638, 640, 641, 642, 645, 647, 664, 665, 669, 673, 675, 677, 682, 683, 684, 685, 686, 687, 688, 690, 698, 699, 700, 701, 705, 712, 713, 717, 719, 724, 726, 731, 733; 1893a, 873, 878; 1893b, 184; 1893d, 466.—Buttel-Reepen, 1900a, 585, 586, 589, 590, 592, 594, 598; 1902, 166, 167, pl. 6, figs. 7, 11a, 11b, 12; 1904, Jan. 26, 24–25; 1905, July, 52–53.—Carus, 1884, 131.—Chatin, 1887d, 1003.—Cobbold, 1860a, 21; 1867k, 200–205 (from sword-fish); 1879b, 458, 460, 461.—Crep., 1837, 316, 327.—Darr, 1902, 662, 664, 665, 666, 667, 689.—Dies., 1850a, 366–367 (includes Hirudinella Garsin; Fasc. fusca Bosc; F. cl. Menzies; F. scombri pelamidis Tilesius; D. coryphænæ Rud.) (in Coryphæna hippurus; Brazil; Pelamys sarda, Thynnus vulgaris); 1859c, 431.—Duj., 1845a, 459–460.—Goto, 1891a, 181 (Distonum).—Jackson, 1888, 644, 646, 647–648.—Jægers., 1900, 72.—Jourdan, 1881a, 438–448, pls. 7–8, figs. 1–10 (anatomy); 1881b, 12 pp., pls. 7–8, figs. 1–10; 1881c, 604–605.—Juel, 1889, 13, 17, 18, 19.—Kroyer, 1838–1840a, 596 *(in* Thynnus vulgaris).—Lander, 1904a, 8.—Lint., 1898, 539–540, pl. 53, figs. *8–11; 1901b,* 415, 421, 445, 448 (in Thunnus thynnus, Xiphias gladius).—

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claviforme Brand., 1888, 247–251, pl. 17, fig. 1 (in Tringa alpina).—Braun, 1892a, 568, 578, 586, 662, 700; 1893a, 874, 910.—Jacoby, 1900, 11.—Jægers., 1900, 739, 740.—Looss, 1899b, 618, 619, 620; 1902m, 704.—Luehe, 1899, 537.—Nicoll, 1906, 524.—Odhn., 1900, 13.—Staff., 1905, Apr. 11, 692.—Stoss., 1892, 148–149 to (Brachycœlium).—Ward, 1901, 184.

clavigerum Rud., 1819a, 103, 389–391, 589 (in Bufo viridis at Berlin, and B. cinereus, Rana esculenta, R. temporaria, Hyla arborea).—Baird, 1853a, 52 (Fasc. ranæ Froelich).—Bellingham, 1844, 424.—Ben., 1858a, 1861a, 93, 96–97.—Bettend., 1897a, 4, 5, 8, 15; 1897, 308, 309, 312, 319.—Biehringer, 1888a, 234.—Brand., 1891b, 265.—Braun, 1892a, 635, 707, 715, 736, 750, 751; 1893a, 865, 879.—Cobbold, 1858b, 162, pl. 33, figs. 52–53 (in Rana temporaria); 1860a, 16; 1879b, 454.—Crep., 1837, 310, 311, 312, 316, 322, 325, 328, 329; 1839, 287.—Dies., 1850a, 352, 388 (includes Fasc. ranæ Froelich; D. c. Rud., ex parte, as syn. of D. retusum Duj.); 1858, 429; 1858c, 338 (Cerc. (Acanthocephala) ornata), adult in Rana temporaria, Pelophylax esculentus; larva in Planorbis corneus, Hydrachus concharum); 1859c, 429 (Cerc. armata major, in Lymnæus stagnalis, L. ovatus, Planorbis corneus; Belgia), 434 (Cerc. ornata).—Duj., 1845a, 404.—Duncker, 1881a, 23; 1882, 188; 1884a, 40.—Erc., 1881e, 77, 78, 82, 83, 84, 85, 89; 1882a, 313, 314, 318, 319, 320, 321, 325.—Fil., 1857c, 32.—Florance, 1866a, 11.—Gamb., 1896a, 72.—Hoyle, 1890, 537, 540.—Jackson, 1888, 648.—Juel, 1889, 37.—Kampmann, 1894b, 446, 448, 454, 457, 459, 460, 461, 462, pl. 20, figs. 14–18.—Kath., 1894a, 152.—Kowal., 1894d, 3; 1895, 350–351; 1902d, 9 (to Pleurogenes).—Lamouroux, 1824a, 562.—Leuck., 1863a, 477, 520.—Linst., 1873, 1 (Cerc. ornata La Valette is young stage); 1882, 18; 1887, 97, 98, 99, 105; 1890f, 184; 1904, 254.—Looss, 1885b, 24, 39, 40, pl. 23, fig. 15; 1893b, 810, 811 (includes D. neglectum Linst., 1887); 1894a, 1, 2, 82, 83, 84, 85, 87, 91–101 (1 text fig.), 102, 103, 104, 105, 106, 107, 119, 124, 126, 137, 140, 158, 159, 165, 167, 173, 176, 179, 181, 191, 192, 197, 202, 205, 206, 208, 209, 210, 211, 212, 219, 227, 228, 230, 234, 264, 270, 273, pl. 2, figs. 30–32; pl. 8, figs. 165–166, 170–175; pl. 9, fig. 189 (includes D. neglectum Linst., D. medians Olss., e. p.); 1894d, 5, 50; 1896, 94, 95; 1898, 461; 1899b, 611, 614, 617 (type of Pleurogenes), 622, 623.—Luehe, 1899, 536; 1901, 169.—Mol., 1859, 846–848, pl. 3, fig. 3 (in Pelophylax esculentus; Padua).—Mont., 1888a, 15, 65; 1893, 71, 95, 102; 1896, 152.—Mueh., 1898, 23.—Nickerson, 1900, 814, 815.—Noack, 1892, ——.—Nord., 1840, 616.—Olfers, 1816, 44.—Pag., 1857, 17, 18, 39–40. 52, pl. 4, figs. 8–14 (in brown and green frogs).—Par., 1887, 490.—Poir., 1885, 101.—Schwarze, 1885, 76.—Sieb., 1835, 64, 65; 1836, 233, 239.—Sons., 1893, 187, 189 (in Rana esculenta).—Staff., 1905, Apr. 11, 684.—Stiles, 1901, 197, 198, 199, 201.—Stoss., 1889, 64; 1896, 128; 1898, 43–44.—Wolf, 1903, 612, 613, 619, 621.—Zuern, 1882, 220.

clavigerum Rud., 1819a, of Duj., 1845a.—Looss, 1894, 101 (renamed D. confusum Looss); 1896, 88, 91, 93, 94, 95.

clupeæ (Schrank, 1788) Zed., 1803a, 218 (in Mayfische; Rhine).—Baird, 1853a, 54 (syn. of D. appendiculatum Rud.).—Dies., 1850a, 371 (syn. of D. app. Rud.).—Rud., 1809a, 437.

clupeæ rhenanæ Rud., 1809a, 437–438 (includes Fasc. alosæ Hermann, 1783, F. clupeæ Schrank, 1788, D. clupeæ Zed., 1803); 1819a, 110 (syn. of D. app. Rud.).—Baird, 1853a, 54 (syn. of D. app. Rud.).—Dies., 1850a, 371 (syn. of D. app. Rud.).

cochlear Dies., 1850a, 357–358 (in Sterna cantiaca, S. minuta; Brazil) (D. cochleariforme [sternæ] Rud., 1819a, 681, renamed).—Braun, 1901, 561, 563; 1901, 895.

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1902b, 56 (includes D. diesingi Cobbold), 58 (to Microlistrum).—Stoss., 1892, 37, 179.

cochleariforme Rud., 1819a, 681–682, 687 (in Pelecanus aquila, ?Sterna cantiaca [see D. cochlear], S. minuta, S. sp.; Brazil).—Braun, 1901, 561, 563; 1901, 895; 1902b, 55 (type of Microlistrum), 56, 58 (of Stoss., 1892, 37; Duj., 1845a, 449; Rud., 1819a, 681; pars, syn. of Microlistrum cochlear).—Cobbold, 1860a, 13.—Dies., 1850a, 357.—Duj., 1845a, 449.—Stoss., 1892, 37, 179.

cochleariforme sternæ Rud., 1819a, 681, of Dies., 1850a, 357 (renamed D. cochlear Dies.).

cœlebs Linst., 1875, 192–193, pl. 3, fig. 15 (in Fringilla cœlebs).—Braun, 1893a, 870.—Stoss., 1892, 176 (to Agamodist.).

colomaticum Giard & Billet, 1892a, 614–615 (in cattle; Tonkin).—Gomy, 1897a, 374, 375.—Looss, 1899b, 634; 1907, Feb. 1, 126 (in ox; Cao Bang, Tonkin).—Rail. & Marotel, 1898, 30, 31, 32.—Stiles, 1898a, 57 (syn. of Dicrocœlium pancreaticum).—Ward, 1895, 332 (in Bos taurus).

coleostomum Looss, 1896b, 101–106, 154, pl. 7, figs. 66–68 (in pelican; Egypt); 1899b, 578, 581, 585 (type of Ascocotyle).—Braun, 1901b, 34.—Vaullegeard, 1901, 143 (colostomum).

colturionis (Schrank, 1790) Zed., 1803, 211.—Cobbold, 1860a, 15.—Dies., 1850a, 396.—Rud. 1809a, 430; 1819a, 119.—Stoss., 1892, 179.

colostomum Vaullegeard, 1901, 143 (for coleostomum).

colubri (Bosc, 1802) Rud., 1809a, 434–435 (in Coluber sp. americana).—See bosci.

colubri americani Rud., 1819a, 121 (colubri, 1809, renamed).—Cobbold, 1859d, 364 (syn. of D. bosci).—Dies., 1850a, 398 (includes Fasc. colubri Bosc).—Sons., 1892, 92.

colubri murorum Rud., 1819a, 121 (in Coluber murorum).—Dies., 1850a, 367 (syn. of D. allostomum Dies.).—Duj., 1845a, 452.—Stoss., 1895, 230.

colubri natricis intestinale Rud., 1809a, 433–434; 1819a, 103 (syn. of D. mentulatum Rud.) (in Coluber natrix).—Dies., 1850a, 355 (syn. of D. ment.).

colubri natricis pulmonale Rud., 1809a, 434; 1814a, 103; 1819a, 99, 377 (syn. of D. naja Rud.) (in Coluber natrix).

colubri tesselati Rud., 1819a, 121 (in Coluber tesselatus).—Dies., 1850a, 355 (syn. of D. mentulatum Rud.).

columbæ Mazzanti, 1889a, 161–165 (in Columba livia; Pisa), teste Par., 1894, 145; 1890, 139.—Braun, 1902b, 117.—Hass., 1896a, 2, 3 (syn. of Mesogonimus commutatus (Dies.).—Sons., 1889, 283.

commune Olss., 1867, 31–32 (in Labrus).—Braun, 1891d, 424 (in Crenilabrus griseus).—Lint., 1901, 415, 485, 486.—Looss, 1901d, 399.—Odhn., 1901, 485, 486, 487, 494, 495, 499, 500, 503, 508; 1905, 321.—Sons., 1891, 257, 258 (in Crenilabrus griseus. Labrus mixtus).—Stoss., 1886, 32.—Also reported for Anguilla vulgaris, Cottus bubalis, C. scorpius, Crenilabrus melops, Labrus maculatus. L. sp.

commune Hausmann, 1896?, 24.—Looss, 1899b, 571 (possibly identical with Creadium angusticolle).

commutatum Dies., 1858e, 339–340 (D. dimorphum, 1852, 555, pl. 16, 1 [not Dies.] renamed) (t. h. Phasianus gallus; Pisa).—Anacker, 1887c, 513.—Braun, 1893a, 874; 1900, 25; 1900h, 19, pl. 1, figs. 1, 2; 1902b, 116.—Caruccio, 1886, 293.—Cobbold, 1860a, 15.—Hass., 1896a, 2, 3 (to Mesogonimus).—Landois, 1882, 23.—Looss, 1899b, 650 (perhaps a Clinost.).—Mont., 1893, 155.—Rail., 1890, 131.—Schneidemuehl, 1896, 303 (kommutatum).—Sons., 1889, 11; 1889, 282–283; 1890, Feb. 15, 138.—Stoss., 1892, 175 (to Mesogonimus).

compactum Cobbold, 1859d, 363, pl. 63, figs. 1–3 (in lung, Viverra mungos); 1861, 118; 1864, 16, fig. 2; 1879, 299, 419; 1884g, 976.—Braun, 1892a, 663; 1893a, 876; 1899g, 492, to Paragonimus; 1901e, 329, 330, 333, 334.—Kerbert, 1878a, 272.—Mont., 1893, 83, 155.—Sons., 1884, 19.—Stiles & Hass., 1890a, 605, to Paragonimus.—Stoss., 1892, 31 (to Mesogonimus).—Also reported for Mungos fasciatus.

complanatum Rud., 1814a, 103–104 (in Ardea cinerea; Berlin); 1819a, 98, 376–377, 680.—Braun, 1893a, 873; 1899g, 465, 485, 486, 489 (specimens from Pavia and Cagliari, as syn. of Clinost. heterost.), 490; 1900h, 14, 15, 17, 18, 19, 23 to Clinost., 24, 25, 26, 27, 28, 29, 30; 1900, 141; 1901, 561.—Cobbold, 1860a, 9.—Dies., 1850a, 338 (to Dist.), (t. h. Ardea cinerea; Berlin), 354.—Duj.,

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1845a, 399–400 to (Dicrocœlium).—MacCallum, 1899, 697, 706.—Olfers, 1816, 44.—Par., 1887, 23 (syn. of D. hians) (to Clinost.); 1887, 489.—Stoss., 1892, 160.

complanatum from Ardea cinerea and Nycticorax griseus, labeled complanatum (=hians) of Genueser Sammlung, from Pavia and Cagliari, are according to Braun, 1900h, 19, identical with Clinost. heterost.

complanatum Erc. of Par., 1894, 144, and Ward, 1895, 341, from Canis fam., misprint for campanulatum.

complexum Stiles & Hass., 1894e, 425–426, pl. 1, figs. 3–4, to (Dicrocœlium) (in Felis catus dom.; U. S. A.); 1894f, 89–91.—Braun, 1900h, 16.—Looss, 1896, 58; 1899b, 565 (to Metorchis).

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concavum Crep., 1825a, 45–47, 83, figs. 7–8 (in Colymbus rufogularis); 1837, 310, 314, 318; 1846, 138, 141, 145, 146.—Braun, 1893a, 874, 879; 1900h, 6; 1901, 564.—Cobbold, 1860a, 11.—Dies., 1850a, 340–341.—Duj., 1845a, 448.—Jacoby, 1900, 22, 23.—Jægers., 1898, 9, 10, 12, 14, 16.—Kowal., 1894, 2; 1895, 350.—Looss, 1899b, 586 (to Tocotrema); 1900, 607, type of Cryptocotyle.—Luehe, 1899, 539 (type of Cryptocotyle).—Mueh., 1898, 4, 19–21, 27, 80–83, figs. 6, 20, 26.—Stoss., 1892, 158; 1897, 10; 1898, 42.—Reported for Alca torda, Anas clangula, A. fusca, A. glacialis, A. hornschuchii, A. marila, Bucephala clangula, Colymbus cristatus, Fuligula marila, Harelda glacialis, Larus glaucus, Mergus merganser, M. serrator, Podiceps nigricollis.

confusum Looss, 1894a, 2, 17, 83, 84, 91, 92, 93, 95, 96, 99, 101–104, 105, 106, 108, 113, 126, 135, 137, 149, 150, 159, 167, 177, 179, 180, 181, 182, 191, 192, 197, 210, 211, 212, 214, 216, 217, 227, 228, 230, 234, 256, 263, pl. 2, figs. 33–35, pl. 8, figs. 164, 167 (D. clavigerum of Duj., 1845a, 404 (in Rana esculenta; Paris, Rennes), renamed; includes also D. clavigerum, ex parte, and endolobum e. p., of Pag., and clavigerum of Pachinger); 1893b, 810, 811; 1894d, 17; 1896b, 88, 91, 92, 93, 94, 95; 1898a, 460, fig. 2; 1899b, 556, 614, 616, 622, 623 (type of Prosotocus).—Luehe, 1901p, 169.—Mueh., 1898, 23.—Nickerson, 1900, 814, 815.—Stiles, 1901, 197.

conicum Polonio, 1859, teste Par. 1894, 627 [see also Diplost. conicum].—Anacker, 1892c, 94.

conis Crep. (misprint for D. conus Crep., in Perroncito, 1886, 250).

coniunctum Rivolta, 1884, 26, for conjunctum, 1860.

conjunctum[a] Cobbold, 1860a, 8 (t. h. American Canis fulvus); 1860, 349; 1861, 118; 1864, 20–22, pl. 2; 1873, 81; 1876, 210; 1879b, 28, 30–34, 299, fig. 56; 1883, 401, fig. 16.—R. Bl., 1888a, 612–614 (two (all to date) human infections, review), figs. 314–315, 631; 1891, 610 (syn. of D. conus).—Braun, 1883a, 65–66; 1892a, 642, 663, 748; 1893, 349, 352; 1893a, 874, 882; 1893f, 386, 389, 425; 1894i, 605; 1895b, 147–148, 151, fig. 65; 1903, 3 ed., 163 (of Cunningham and McConnell, renamed Opisthorchis noverca), 164, fig. 113 (from Canis fulvus).—Brunet, 1902a, 125.—Dunglison, 1893, 338.—Fitz, 1876b, 517.—Gamb., 1896a, 63.—Hackley, 1886, 519.—Hahn & Lefèvre, 1884a, 545–546 (=sinense).—Huber, 1896a, 578 (= O. noverca).—Ijima, 1889b, 146.—Jamison, 1897a, 74.—de Jong, 1887a, 57; 1896a, 2.—Kamensky, 1900a, 17, 23.—Kholodk., 1898, 26, 29–30, pl. 11, fig. 13.—Kuech. & Zuern, 1881, 335.—Leuck., 1889, 355, figs. 162–163.—Lewis & Cunningham, 1872, 168.—Linst., 1873, 100.—Looss, 1899b, 565 (to Metorchis); 1905, 90 (of Lewis & Cunningham, syn. of O. noverca).—Maddox, 1867, 95.—Manson, 1901, 540 (in Homo); 1903, 3 ed., 635, fig. 98 (McConnell in an East Indian, 1874, apparently of but slight pathological importance).—McConnell, 1875, Aug. 21, 271–274, figs. 1–3; 1875, Oct., 772–780, figs. 1–3; 1876, Mar. 4, 343–344, figs. 1–3; 1876, Apr., 242–246, figs. 1–3 (case in man); 1876, July, 314–317; 1878, Mar. 30, 343, 476.—Moniez, 1896, 86, 122–125, 137.—Mont., 1893, 83 (coniunctum), 95.—Mosler & Peiper, 1894, 178.—Neumann, 1892, 529–530, fig. 284.—Perroncito, 1882, 285; 1886, 250, 297.—Rail., 1886, 297; 1893a, 365 to (Brachylaimus).—Schneidemuehl, 1896, 302 (kongenitum).—Simon, 1897, 209, 223–224.—Sons., 1889, 276, 277, 278, 280; 1889, 281 (syn. of D. conus Crep.).—Stiles, 1904i, 34 (to Metorchis).—Stiles & Hass., 1894e, 429–430, pl. 3, figs. 13–15 (consider form from man

[a] All references to "Distoma conjunctum Cobbold" as a parasite of man are based upon the findings of Cunningham, McConnell, and Lewis, and refer in reality to Opisthorchis noverca, q. v.

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distinct).—Stoss., 1892, 24–25 (syn. of D. conus).—Tyson, 1903, 3 ed., 1180.—Ward, 1895, 238 (man, dog), 328 (Homo), 341 (in Canis familiaris).—Wood & Fitz, 1897, 335.

conjunctum of Lewis and Cunningham, in Homo, India; see Opisthorchis noverca.

conoideum (Bloch, 1782) Rail., 1886, 297; 1893a, 366 (syn. of D. echinatum Zed.; includes excavatum Rud., 1819, echiniferum La Val., 1855, ? militare Rud., 1809; cf. Cerc. echinatoides Fil., C. echinifera, C. spinifera); in ducks, geese, swan, etc., and dog.—Ward, 1895, 341 (in Canis familiaris).

conostomum Olss., 1876, 17–18, pl. 3, fig. 37 (in Coregonus oxyrrhynchus).—Braun, 1892, 45; 1892a, 663, 699, 711, 722; 1893a, 872; 1901b, 9, 10, 12.—Looss, 1899b, 605, thinks it a Spathidium; 1901l, 558.—Luehe, 1900aa, 507.—Mont., 1893, 95, 102.—Odhn., 1902, 65, 67.—Stoss., 1886, 22, 62 (in Coregonus oxyrrhynchus).

constrictum Mehlis, in Creplin, 1846, 142, 143 (in Anas mollissima, A. nigra).—Crep., 1846, 142, 143.—Dies., 1850a, 397.—Stoss., 1892, 180.—Reported also for Anas fusca.

constrictum Leared, 1862, 271–273, fig. 21 (in edible turtle).—Braun, 1892a, 569, 763, 764; 1893a, 876 (in Chelone mydas); 1893d, 467; 1899b, 715 (= D. mistroides).—Cobbold, 1879b, 35.—Laveran & R. Bl., 1895, 104.—Leuck., 1861, 79.—Looss, 1899b, 554, 656 (type of Hapalotrema).—Moniez, 1896, 143.—Mont., 1896, 144, renamed mistroides.—Stoss., 1895, 230.

constructum Staff., 1900, 407, misprint for D. constrictum Leared.

continuum Ariola, 1899, 6–8, pl. 1, fig. 6 (in Carcharias rondeletti; Genova).—Linst., 1903, 354.

contortum Rud., 1819a, 118, 424–425 (in Orthagoriscus mola; Naples), 595.—Bellingham, 1844a, 427.—Braun, 1892a, 578; 1893a, 872, 910.—Cobbold, 1879b, 458.—Crep., 1837, 310, 311.—Dies., 1850a, 394; 1858c, 353 (in Orth. mola).—Drago, 1902, v. 15, 20; 1904, v. 79, 4 pp., 1 fig.; 1904, v. 17, 720.—Drumond, ——, 240.—Duj., 1845a, 469.—Kroyer, 1852–53a, 745 (in Orth. mola).—Lint., 1898, 528–530, pl. 48, figs. 3–7; 1901, 415 (in Mola mola), 422, 466.—Looss, 1894a, 165, 190; 1899b, 631 (type of Accacœlium).—Luehe, 1900, 487.—Mont., 1888a, 7, 8, 12; 1888, 198, 199; 1891, 110; 1893, 13, 14, 19. 22, 23, 27, 29. 30, 32, 33, 34, 36, 37, 40, 44, 46, 47, 61, 64, 79, 80, 81. 82, 83, 84, 85, 86, 87, 88, 90, 93, 94, 95, 97, 102, 107, 108, 113, 115, 119, 120, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 150, 152, 169, pl. 1, fig. 12, pl. 3, figs. 16, 22, 25, 26, 32, pl. 4, figs. 33–37, pl. 8, figs. 123 (type of Accacœlium); 1896, 151, 153.—Olss., 1876, 17.—Sons., 1890, 140 (in Orth. mola L.); 1891, 265.—Stoss., 1896, 190, to (Podocotyle).

conum Huber, 1896a, 578 (refers to Stoss., syn. of D. conjunctum=O. noverca); see conus Crep.

conus Crep., 1825, 50–53 (in Felis catus dom., Canis vulpes); 1837, 310; 1839, 286, 288.—Baillet, 1866b, 105 (includes Amphist. truncatum Rud.).—R. Bl., 1891, 610 (syn. D. conjunctum).—Braun, 1892a, 580, 613, 663, 699; 1893a, 875; 1893f, 382, 383, 384, 386, 387, 388, 389, 390, 391, 424 (of Sons. in dogs and cats in Italy, syn. of D. felineum); 1893g, 802 (= Amphist. truncatum Rud.).—Cobbold, 1875n, 819 (Distoam); 1884g, 976.—Dies., 1850a, 404 (syn. of Amphist. truncatum); 1858c, 349–350 (in Canis vulpes; Felis catus dom.) (to Dist.).—Duj., 1845a, 331, 440.—Hahn & Lefèvre, 1884a, 538.—Hilgendorf, 1870, 566–567.—de Jong, 1896a, 2, 3, 4, 6.—Kamensky, 1900a, 5.—Leuck., 1863a, 589.—Linst., 1878a, 43, 44.—Moniez, 1896, 136, 139.—Sons., 1889, 273, 276, 277, 278, 279, 280, 281 (syns. Amphist. truncatum Dies., D. campanulatum Erc., D. conjunctum Cobbold, D. felineum Rivolta, D. truncatum Erc.); 1890, v. 7 (3), 15 Feb., 134–138.—Stoss., 1892, 24, 25 (includes D. truncatum Erc., D. conjunctum Cobbold, Amphist. truncatum Dies.) (in Vulpes vulgaris; Canis fulvus, America; Canis familiaris, Pisa; Felis domestica).—Wagener, 1857, 102, pl. 22, figs. 1, 2; 1858, 102.—Ward, 1895, 341 (see D. truncatum) (in Canis familiaris).

conus of Gurlt, 1831, 193, 373–375, pl. 8, figs. 34–36 (nec Crep., 1825).—Braun, 1893f, 383, 384, 385, 386, 387, 389, 390, 422 (syn. of D. felineum); 1903, 3 ed., 157 (syn. of Opisthorchis felineus).—Dies., 1858c.—de Jong, 1896a, 10.—Rail., 1893a, 361 (= D. fel.).—Ward, 1895, 243 (syn. of D. fel.), 328 (in Homo), 341 (in Canis fam.); 1903, 869 (syn. of Opisth. fel.).

conus of Sons., 1889 (sub D. truncatum), see felineus.—Braun, 1892, 580, 613, 663, *699; 1893, 874;* 1893e, 348, 349, 350, 352; 1893f, 386, 424.

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convolutum Brand., MS. in Braun, 1901f, 565, in Platalea ajaja; 1902b, 24 (syn. of Mesaulus grandis).

cornifrons Leidy, 1878, 382–383 (in Donax fossor).

cornu Zed., 1800a, 180–181, pl. 2, fig. 1–3 (in Ardea cinerea; Europe).—Dies., 1850a, 327 (to Monost.).—Nord., 1840, 627 (to Amphist.).—Rud., 1809a, 346 (to Amphist.).

coronarium Cobbold, 1861e, 119 (in Alligator mississippiensis; died in England); 1864, 17; 1879b, 455 (All. miss.).—Braun, 1892a, 699; 1899, 630; 1901b, 34.—Looss, 1896b, 114, 117, 118; 1899b, 575, 581, to Acanthost.—Luehe, 1899, 532.—Par., 1896, 7–9, fig. 3, to (Echinost.).—Pavesi, 1881, 294.—Stoss., 1895, 230; 1899.—Also reported for Crocodilus americanus.

coronatum Rud., 1819a, 686 (in Didelphis? virginiana; Brazil).—Braun, 1900, 27; 1901e, 318, 319, 320, 323.—Cobbold, 1879b, 432.—Dies., 1850a, 400 (to Rhopalophorus).—Duj., 1845a, 425.—Looss, 1899b, 581.—Stiles & Hass., 1898a, 93, 96 (type of Rhopalias).—Stoss., 1892, 30–31 (to Echinost.).

coronatum Wagener, 1852, 567–569, figs. 4–6 (in Corvina nigra; Nice).—Braun, 1892a, 579, 583, 643; 1901b, 34, 1901, 568; 1902b, 28, 30, 31.—Carus, 1884, 127.—Dies., 1856, 64; 1858e, 352 (in Corvina (Sciæna) nigra).—Looss, 1899b, 578, 581, 582, 583, type of Anoiktost.—Mont., 1893, 84 (? of Dies. or of Wag.).—Stoss., 1885, 157; 1886, 37.

coronatum Rentsch, 1860, 38, pl. 11, fig. 2a, 41 (in Gasterosteus spinachia).

corpulentum Lint., 1905, 327, 334, 378, 382, figs. 180–182 (in Lagodon rhomboides, Orthopristis chrysopterus; Beaufort, N. C.).

corrugatum Duj., 1845a, 409–410 (in Sorex tetragonurus; Rennes), to (Brachylaimus).—Braun, 1901e, 341, 342.—Cobbold, 1879b, 296.—Dies., 1850a, 360.—Stoss., 1892, 13.

corvinæ Stoss., 1886, 46–47, pl. 7, fig. 29 (in Corvina nigra; Triest); 1886, 36; 1898, 56; 1899, 15.—Braun, 1892a, 579; 1902b, 31.—Looss, 1899b, 578, 581.—Mont., 1893, 83.

coryphænæ (Bosc., 1802) Rud., 1809a, 436–437 (includes Fasc. fusca Bosc., 1802; F. cory. Bosc., 1802; F. caudata Bosc., 1802; F. coryphænæ hippuridis Tilesius); 1819a, 122, 685 (in Coryphæna hippuris).—Baird, 1853a, 60 (syn. of Hirudinella ventricosa).—Cobbold, 1879b, 460 (coryphenæ), 461 (coryphœnæ).—Dies., 1850a, 367 (syn. of D. clavatum Rud.), 373 (syn. of D. tornatum Rud.).—Poir., 1885, 6.

coryphenæ Cobbold, 1879b, 460, for coryphænæ.

coryphœnæ Cobbold, 1879b, 461, for coryphænæ.

[*costæ* D. Valle (a tunicate).]

cranum Huber, 1896a, 575, misprint for crassum=buskii.

crassicaudatum Busch, 1851, 99–100, pl. 15, fig. 13 (in Saggita).—Wagener, 1860, 166.

crassicolle Rud., 1809a, 378–379 (in Salamandra atra) (Fasc. salamandræ Frœlich, renamed); 1819a, 102, 385–386.—Baird, 1853a, 52.—Braun, 1892a, 603, 681; 1893a, 881; 1895b, 128, fig. 45.—Cobbold, 1860a, 18.—Crep., 1837, 316; 1846, 147, 148.—Dies., 1850a, 356; 1858, 339 (in Triton marmoratus).—Duj., 1845a, 404–405, to (Brachycœlium).—Kampmann, 1894b, 454, 457.—Kerbert, 1881a, 536, 573.—Linst., 1887, 97, 98.—Looss, 1894a, 1, 82, 83, 84; 1899b, 611, 612, 613, 614, 618; 1902m, 705, 769, 773, 774, 816, 821, 822 (type of Brachycœlium).—Luehe, 1899, 536; 1900, 562, 563.—Minot, 1878a, June 11, 1–12, pl. 1, figs. 1–17.—Mont., 1888a, 25, 38.—Olfers, 1816, 45.—Par., 1896, 2; 1896, 13–16 to (Dicrocœlium) (includes D. enterarchos Fil., D. salamandrinæ perspicillatæ Sons.).—Pontallié, 1853, 211–219.—Stiles, 1901, 196, 198, 199, 200, 201, 202.—Stiles & Hass., 1898a, 83, 97 (type of Brachycœlium).—Stoss., 1889, 63; 1895, 214–215; 1897, 9; 1898, 32.—Ziegler, 1883, 545.—Also reported for Anguis fragilis, Rana temporaria, Salamandra maculosa, Salamandrina perspicillata, Triton alpestris, T. cristatus, T. punctatus, T. tæniatus.

crassiusculum Rud., 1809a, 373, 408–409, 429 (in Falco melanaetus) (Plan. bilis Braun renamed); 1819a, 112.—Braun, 1891d, 424 (in Circus æruginosus); 1892a, 583, 584, 610, 663; 1893a, 875; 1893, 353; 1893f, 426; 1901, 561; 1902b, 8, 10.—Cobbold, 1860a, 15.—Crep., 1837, 326; 1846, 129.—Dies., 1850a, 376 (includes D. felleum falconis chrysaëti Viborg); 1858e, 353 (in Falco buteo).—Duj., 1845a, 441–442.—Linst., 1873, 99.—Looss, 1896b, 58; 1899b, 617 (to

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Metorchis).—Mont., 1893, 15.—Mueh., 1898, v. 1, 21, 23–24, 87–89, fig. 1.—Olfers, 1816, 46.—Stoss., 1890, 50; 1892, 151.—Wedl, 1857, 244–245, pl. 1, fig. 4.—Also reported for Aquila chrysaetos, Archibuteo lagopus, A. vulgaris, Buteo vulgaris, Circus æruginosus, C. rufus, Colymbus septentrionalis, Falco albicilla, Mergus serrator, Nyctea nivea.

crassum Sieb., 1836, 234 (in Hirundo urbica) ("Hoden —— zwischen dem Porus anticus und posticus verborgen"); 1848, 143.—Braun, 1893a, 874; 1902b, 46, 94–95.—Crep., 1837, 327, 328; 1846, 133.—Dies., 1850a, 397.—Leuck., 1863a, 587.—Looss, 1899b, 557.—Poche, 1907, 126.—Stoss., 1892, 156.—Also reported for Hirundo domestica.

crassum Cobbold, 1860a, 5–6 (buskii Lankester, renamed; in Homo); 1864a, 192–194, fig. 42; 1866, 6; 1875i, 423; 1876g, 285–296, 1 fig.; 1876h, 210, 211; 1876i, 297–305, 1 fig.; 1879b, 17, 20–28, 421, 480, fig. 2; 1883, 401; 1884g, 976.—Aitken, 1866, 804, 839; 1872, 146, 205; 1874, 58.—Anders, 1903, 6 ed., 1245.—Aschoff, 1892, 495.—Bassi, 1875b, 507.—Biermer, 1863a, 395 (grassum).—Braun, 1883a, 62–63; 1902b, 95; 1903, 3 ed., 153 (syn. of Fasciolopsis buski); 1906, 159, fig. 90.—Brunet, 1902a, 125.—[Budd, 1845, 399, fig. 20; 1846, 390, fig. 20; 1846, 444; 1852, 484, fig. 20; 1857, 494, fig. 20.]—Busk, 1859.—Clarke, 1894b, 244–245, fig. 21.—Dav., 1877a, lxxvii, 258–259.—Dunglison, 1893, 338, 820.—Eichhorst, 1901a, 301.—Gamb., 1896a, 63.—Hackley, 1886, 518, fig. —, 882.—Hahn & Lefevre, 1884a, 541–542, 544.—Harley, 1864a, 62.—Hoyle, 1890, 538.—Huber, 1896a, 575 (cranum).—Jackson, 1888, 653.—Jacob, 1891a, 1287.—Jamieson, 1897a, 73.—Kholodk., 1898, 30, pl. 11, fig. 15.—Leidy, 1891, 234; 1904a, 239–241 (includes Fasc. magna).—Leuck., 1863a, 526, 586–588, fig. 196; 1876, v. 2 (3), 870, 871.—Looss, 1899b, 557, to Fasciolopsis; 1905, 110 (syn. of Fasciolopsis buski); 1907, Feb. 1, 124.—Manson, 1880, May, 66; 1901, 440, 543; 1903, 3 ed., 631, 639.—Moniez, 1896, 114, 115.—Mosler & Peiper, 1894, 176.—Oppenheim, 1900, 181.—Packard, ——, 522.—Rail., 1893a, 363–364 (includes D. buskii Lankester, 1857; D. (Dicrocœlium) buski).—Roberts, 1888, 673.—Simon, 1897, 223 (cranum).—Sinclair, 1891, Dec. 26, 1468.—Smith, 1881, July, 14 [=? Tænia solium or T. saginata].—Stoss., 1892, 27 (syn. of D. rathouisi Poir.).—Verrill, 1870, 171.—Vogt, 1878, 10, 14.—Wagner, 1883, 121.—Walker, 1891, 5 Oct., 1205, figs. 1–2.—Ward, 1895, 328 (syn. of D. buskii); 1903, 867 (syn. of Fasciolopsis buski).—Wood & Fitz, 1897, 335.

crassum Olss., 1876, 25, pl. 4, figs. 27–28 (in Hirundo urbica) [nec Sieb., 1836].—Braun, 1902b, 46 (? syn. of Plagiorchis maculosus), 94, 95.—Looss, 1899b, 557 (? syn. of maculosum Rud.).

crassum Cobbold, of Leidy, 1891, p. p., 234; 1904a, 239–241 (in Cervus virginianus, Bos taurus).—Stiles, 1898a, 51 (syn. of Fasc. magna).—Ward, 1895, 253, 332, 335, 338 (in Bos taurus, Ovis aries, Equus caballus) (p. p. syn. of Fasc. magna); 1903, 866.

crenatum (Rud., 1802 [nec Frœlich, 1802]) Rud., 1809a, 387 401, 404–405, pl. 5, fig. 1 (in Gasterosteus aculeatus); 1810a, 376; 1819a, 110 (syn. of D. appendiculatum Rud.).—Dies., 1850a, 371 (syn. of D. app.).—Lander, 1904a, 1 (to Hemiurus).—Luehe, 1901, 399 (extensive synonymy), 401 (not Rud., 1810, 376, from Salmo salar), 402.—Mont., 1891, 497, 522.—Odhn., 1905, 352 (type of Brachyphallus).—Olfers, 1816, 46.—Wagener, 1860, 166, 183 (in Gast. ac.).

crenatum Mol., 1859, 840–842, pl. 1, fig. 3 (in Centrolophus pompilius; Padua).—Braun, 1893a, 873.—Carus, 1884, 125.—Looss, 1899b, 640 (to Hemiurus).—Luehe, 1901, 399 (not Rud.), 402 (cf. D. excisum Rud.).—Odhn., 1905, 352 (to Brachyphallus).—Stoss., 1886, 14; 1898, 27.

[*cristallinum* Ren. (a tunicate).]

cristatum Rud., 1819a, 117–118, 422–423 (in Stromateus fiatola; Arimini).—Carus, 1884, 128.—Cobbold, 1860a, 37.—Crep., 1837, 311.—Dies., 1850a, 393.—Duj., 1845a, 432.—Mont., 1893, 193.—Stoss., 1886, 47.—Also reported for Hippocampus brevirostris.

croaticum Stoss., 1889, 183–184, pl. 4, figs. 5–7 (in Carbo graculus; Fiume, Croazia); 1890, 131; 1892, 165 (to Echinost.).—Braun, 1891d, 421; 1892a, 763, 765; 1893a, 911.—Reported for Carbo cormoranus.

crocodili Poir., 1886, 30–32, pl. 1, figs. 4–5 (in Crocodilus siamensis).—Braun, 1892a, 722.—Looss, 1899b, 575, 578.—Mont., 1893, 43, 83, 86, 95, 102.

crotali Humboldt [an arachnoid, now in Porocephalus].—Dies., 1836, 21; 1850a, *612 (syn. of* Pentast. proboscideum).—Leidy, 1850b, 97 (syn. of Pentast.

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prob.); 1904a, 32.—Nord., 1840, 645 (to Porocephalus).—Rud., 1809a, 433.—Stiles, 1891a.

crotali durissi Rud., 1809a, 433 (for crotali), 434; 1814a, 103; 1819a, 124 (syn. of Pentast. proboscideum).

crucibulum (Rud., 1819) Duj., 1845a, 435, to (Crossodera) (in Muræna conger; M. cassini).—Dies., 1850a, 322 (to Monost.).—Tennent, 1906, 640 (to Gasterost.).

cryptobothrium Ben., 1870, 1871a, 31, pl. 5, fig. 16 (in Trigla gurnardus; Belgium).

crystallinum Rud., 1819a 100, 380–382, 595 (in Rana esculenta, R. temporaria, Bufo viridis, B. igneus, Vipera berus; Berlin).—Bettend., 1897, 308, 311, fig. 28, fig. 4; 1897a, 4, 7, pl. 1, fig. 4.—Brand., 1888a, 14.—Braun, 1893a, 875.—Dies., 1850a, 352 (to Dist.); 1858e, 338.—Duj., 1845a, 453–454.—Hannover, 1864a, 3 (chrystallinum).—Pag., 1857, 39, 46, pl. 4, fig. 6 (in Frosch).

cteniceps Leidy MS. in Stiles & Hass., 1894d, 249 (manuscript name found in bottle containing parasite of Muskrat, published as D. echinatum; see Leidy, 1888, 126–127) (in Fiber zibethicus).

cucumerinum Rud., 1809a, 360–361 (in Avis riparia; gen. sp. incert.); 1819a, 94.—Braun, 1899f, 465–468 (is a Monost.); 1901, 561.—Dies., 1850a, 338 (to Dist.).—Olfers, 1816, 44.—Stoss., 1902, 9, 32 (to Typhlocœlum).

cuneatum Rud., 1809a, 358–359 (in Otis tarda); 1819a, 93 (Greifswald).—Anacker, 1892c, 94.—Braun, 1893a, 877; 1893d, 467; 1901, 13, 15; 1901, 561; 1902b, 69, 72, 73, 74, 79 (=D. ovatum autt. (nec D. ov. Rud.); Fasc. ov. Rud. part) (to Prosthogonimus).—Cobbold, 1860a, 9.—Crep., 1846, 134.—Dies., 1850a, 336 (to Dist.)(in Otis tarda; (Gryphiæ, Rud., intestine)(in Pavo cristatus, Gurlt).—Duj., 1845a, 445.—Looss, 1899b, to Prosthogonimus.—Luehe, 1905, 159.—Olfers, 1816, 44.—Schneidemuehl, 1896, 303 (kuneatum).—Stoss., 1892, 180.

cuspidatum Looss, 1896b, 97–101, 104, pl. 7, figs. 64–65 (in Milvus parasiticus; Matarieh); 1899b, 578, 581, 584 (type of Centrocestus).—Braun, 1901b, 34.

cyclopteri Rud., 1809a, 438 (in Cylopterus lumpus); 1819a, 121.—Dies., 1850a, 373 (syn. of Dist. reflexum), 398.—Stoss., 1886, 47.

cygni oloris Dies., 1858e, 344 (syn. of D. echinatum), based on Bellingham, 1844a, 427.

cygnoides Zed., 1800a, xxiv, 163, 175–176 (in Rana esculenta); 1803a, 213.—Baird, 1853a, 51.—Ben., 1858a, 1861a, 189, 203, 214.—Bensley, 1897a, 326–331, figs. 1–6 (2 forms); 1897, 293.—Braun, 1883a, 56; 1892a, 569, 634, 635, 698, 711, 712, 761, 762, 764, 768, 773, 776, 780, 782, 783, 785, 788, 790, 797, 798, 806; 1893a, 854, 865, 876, 882; 1893d, 467; 1895b, 18, 129; 1899g, 492 to Phyllodist.; 1901b, 9, 10, 12; 1902b, 22.—Cobbold, 1858b, 162; 1860a, 15; 1872b, 91; 1879b, 49, 454.—Crep., 1837, 310, 323, 324, 326.—Desmonceaux, 1868, 21.—Dies., 1850a, 342 (includes D. hylæ Rud.); 1858d, 272; 1858e, 334 (to Dist.) (Cerc. (Acanthocephala) macrocerca) (adult in Pelophylax esculentus; Bombinator igneus; Dendrohyas viridis; Rana temporaria; R. pipiens; R. palustris; R. halecina; Salamandra maculata; S. (Amblystoma) rubra; S. salmonea; young in Pelophylax esculentus; larva in Cyclas cornea).—Duj., 1838a, 7 (embryo); 1838c, 47; 1845a, 396–397 to (Dicrocœlium).—Fil., 1855b, 24, 25; 1857c, 32.—Florance, 1866a, 6, 12.—Fraip., 1880c, 418.—Gamb., 1896a, 72.—Hahn & Lefèvre, 1884a, 516.—Kampmann, 1894b, 446.—Kerbert, 1881a, 566, 575.—Kowal., 1894, 3.—Leidy, 1851b, 207; 1856, 44; 1904a, 48–49 (in Rana pipiens, Salamandra maculata, S. (Amblyostoma) rubra), 87 (in R. palustrus, R. halecina, S. salmonea).—Leuck., 1863a, 511; 1886d, 40.—Linst., 1873, 1 (young= Cerc. macrocerca Fil.); 1887, 97, 101.—Looss, 1885b, 24; 1892a, 125; 1893b, 813, 815; 1894a, 2, 23, 56–64, 82, 110, 125, 127, 136, 137, 138, 153, 154, 159, 162, 168, 169, 174, 178, 182, 184, 189, 200, 201, 204, 206, 211, 215, 216, 227, 230, 244, 251, 253, 256, 269, 275, pl. 1, figs. 23–26, pl. 6, figs. 124–132 (in Bombinator igneus; Hyla arborea; Rana esculenta; R. temp.); 1896b, 46; 1899b, 605–606, type of Gorgodera, 607; 1902m, 784, 807, 810, 846, 851.—Loschge, 1785, 10–14, pl. 1, figs. a–e.—Luehe 1900, 558; 1901, 58.—Miescher, 1840c, 39–42 (in R. esc.).—Mol., 1859, 833 (in Pelophylax esculentus; Padua).—Mont., 1888a, 40, 80 (cignoides); 1893, 82, 148, 149; 1896, 166.—Moul., 1856, 48, 99, 161 (Cerc. macrocerca is larva of; teste Fil.).—Mueh., 1898, 27–28.—Nord., 1840, 617 (sygnoides, misprint).—Odhn., 1902, 64, 65.—Olfers, 1816, 44.—Osborn, 1903, 256.—Pachinger, 1883, 46 pp.—Pag., 1857, 28, 30, 44–46, 47, 52, pl. 6, fig. 1 (in green frog).—Par., 1887, 60; 1887, 332–333; 1887, 490.—Rossbach, 1906, 377, 388.—Rud., 1809a, 367–368; 1819a, 96, 370–371.—Schuberg, 1875, 169.—Sieb.,

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1835, 66, 82; 1842, 298.—Sons., 1890, 136; 1893, 187 (cygnoidis) (in Rana esc.); 1893, 217.—Ssinitzin, 1905, 33, 34; 1906, 682 (in Rana temporaria, R. esculenta; Warschau) (of Looss, named Gorgodera loossi; of Pag., renamed G. pagenstecheri), 684.—Staff., 1900, 405, 409; 1902, 18 Dec. (American), 411, 412, 421, 482, to (Gorgodera) (in frogs and toads), 895; 1903, 15 Dec., 901; 1905, July, 51–52.—Stiles, 1896, 205.—Stoss., 1889, 60.—Valentin, 1841, 51–54.—Will.-Suhm, 1870, 4.—Wagener, 1857, 26, 27, 29–30, 34, 35, 40, 42, 43, 44, 45, pl. 30, fig. 1, pl. 31, fig. 1, pl. 32, fig. 36A, 7.—Walter, 1866, 64.—Reported also for Dendrohyla viridis, Bombinator sp.; Bufo igneus, B. vulgaris, Cyclas, Limnæa sp.; Piscidium; Rana catesbiana, R. clamitans, R. virescens, Salamandra maculosa.

cygnoides var. A. of Bensley, 1897a.—Staff., 1902, 419–421 (syn. of Gorgodera amplicava).

cygnoides var. B. of Bensley, 1897a. —Staff., 1902, 417 (syn. of Gorgodera simplex).

cygnoides ranæ Wagener, 1857, 19–24.

cygnoidis Sons., 1893, 187, for cygnoides.

cylindraceum Zed., 1800a, 164, 188–190, pl. 4, figs. 4–6 (in Rana esculenta); 1803a, 217.—Baird, 1853a, 51.—Bellingham, 1844a, 424.—Ben., 1858a, 1861a, 193.—Bettend., 1897a, 4, 5, 7, 10, pl. 1, fig. 6; 1897, 308, 309, 311, 312, 314, pl. 28, fig. 6.—Blochmann & Bettend., 1895a, 217, fig. 2.—Brand., 1891c, 730; 1891d, 7, 12.—Braun, 1890d, 568; 1892a, 568, 586, 589, 593, 597, 599, 602, 608, 635, 640, 641, 643, 671, 677, 682, 683, 684, 685, 698, 703, 707, 717, 719, 726, 729, 733, 737, 751, 754, 759, 760, 762, 763, 768, 773, 780, 783, 785, 788, 790, 806; 1893a, 865, 876, 882, 910.—Cobbold, 1858b, 162 (in Rana temporaria); 1860a, 17.—Crep., 1837, 310, 323, 326.—Dies., 1850a, 368 (includes Fasc. subclavata); 1858c, 351 (in Rana oxyrrhinus; R. platyrrhinus).—Duj., 1845a, 395–396.—Galli-Valerio, 1898n, 371–373; 1899b, 186–187; 1901c, 365 (in Rana esculenta).—Gamb., 1896a, 72.—Hausmann, 1897b, 14.—Hofmann, 1899, 196.—Jackson, 1888, 650 (reproductive system).—Knoch, 1862, 101.—Kowal., 1894, 3; 1895, 372–390, pl. 8, fig. 9.—Linst., 1887, 97; 1890f, 173–191, 2 pls., figs. 1–39; 1891a, 241–242; 1904, 254.—Looss, 1885b, 6; 1893b, 811, 815; 1894a, 1, 2, 7, 37 (cglindraceum), 64–71, 72 (of Pachinger, 1888, syn. of D. variegatum), 73, 74, 75, 76, 77, 85, 86, 87, 115, 119, 125, 127, 135, 139, 144, 146, 148, 159, 163, 167, 175, 180, 181, 191, 192, 194, 199, 206, 215, 220, 221, 227, 230, 242, 268, pl. 2, figs. 39–42, pl. 7, figs. 147–152, pl. 8, 163 (includes Fasc. subclavata) (in Hyla arborea; Rana esc.; R. temp.); 1899b, 556, 559–600 (type of Haplometra); 1902m, 620.—Luehe, 1899, 533.—Mont., 1888a, 73; 1893, 25, 27, 33, 36, 42, 43, 48, 61, 83, 91, 102, 106, 107, 108.—Moul., 1856a, 49.—Much., 1898, 26.—Nord., 1840, 617, 620 (to Fasc.).—Olfers, 1816, 46.—Olss., 1876, 14; 1893, 10.—Pag., 1857, 43, pl. 5, figs. 3, 4 (in brown frogs).—Rhumbler (1895), v. 4, 553–554.—Rud., 1809a, 336, 349, 393–394; 1819a, 106.—Schauinsland, 1882, 496, 497.—Sieb., 1835, 82; 1852, 1, 16.—Sons., 1893, 187 (in Rana sp.).—Staff., 1902, 909.—Stoss., 1889, 65.—Swammerdam, 1737, 315.—Volz, 1899, 232.—Walter, 1866, 64.—Ziegler, 1883, 488; 1883, 546, pl. 33, fig. 26.—Reported for Bufo vulgaris; Ilybius fuliginosus; Limnæa ovata; Rana fusca; R. oxyrhinus; R. palustris; R. platyrhinus.

cylindraceum Zed. of Pachinger, 1888.—Looss, 1894a, 71, 72 (syn. of D. variegatum Rud.).

cylindricum (Gœze, 1782) Mayer, 1841a, 26, 34.—Looss, 1894a, 71 (syn. of D. variegatum).

cylindricum ranæ Mayer, 1841a, 18–19, pl. 3, figs. 13, 17.

cymbiforme Rud., 1819a, 96, 371 (in Testudo mydas; Arimini).—Braun, 1893a, 876 to Phyllodist.; 1893d, 467; 1899b, —, 715, 720–721; 1899g, 492 (to Phyllodist.); 1901b, 9, 10, 11, 12; 1902b, 19.—Carus, 1884, 129.—Cobbold, 1860a, 18.—Dies., 1850a, 342 (in Halichelys atra).—Duj., 1845a, 451.—Looss, 1899b, 605 (to Spathidium); 1901b, 202, 203, 204, 205, 207 (resembles Spathidium = Phyllodist., but lacks pharynx, hence was made type of a new genus, Plesiochorus); 1901, 557; 1902m, 411, 469, 476, 477, 478, 481 (to Plesiochorus).—Mont., 1896, 165 (cimbiforme).—Odhn., 1902, 37; 1902, 64, 65, 67.—Par., 1846.—Sons., 1893, Feb. 5, 2; 1893, 183, 184, 185 (in Chelonia caretta).—Stoss., 1895, 38, pl. 4, fig. 1; 1895, 215–216; 1897, 9; 1898, 34–35.—Reported for Chelone caretta; C. mydas; Chelonia midas; Thalassochelys caretta; T. corticata).

cymbuliæ delle Chiaje (1841a), 109, fig. 29?.—Pag., 1862, 298.

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cyprinaceum Zed., 1800a, 164, 181–183 (intest. Cyprinorum).—Dies., 1850a, 341 (syn. of D. globiporum).—Looss, 1894a, 41 (syn. of D. glob.); 1902m, 763 (and Sphærost. glob.).—Rud., 1809a, 365, 367.—Stiles, 1901r, 168.

cyprini idi (*peritonei*) Dies., 1858c, 367 (based on Duj., 1845a, 463) (as ? syn. of Tetracotyle echinata) (in Leuciscus idus, Acerina cernua).

cysticola phalangii opilionis Dies., 1855, 64, based on Crep., 1846, 156, see cystidicola.

cysticum Crep., 1846a, 159 (in Planorbis sp.), refers to Henle, 1835, 597.—Also reported for Planorbis marginatus, Nephelis vulgaris.

cystidicola Crep., 1846a, 156 (in Phalangium opilio); 1851, 304.—Dies., 1858e, 356 (in Phal. opilio).

dactyliferum Braun, 1892a, 568, for dactylipherum.

dactylipherum Poir., 1885, 10, pl. 23, fig. 3 (in Argonauta).—Braun, 1889a, 395 (dactyliferum); 1892a, 568 (dactyliferum); 1893a, 873.—Buttel-Reepen, 1902, 167, 172, pl. 6, fig. 14.

deflectens Rud., 1819a, 677–678, 745 (in Sylvia sp., Motacilla sp.; Brazil).—Braun, 1901, 561, 563; 1902b, 101 (to Dicrocœlium), 102.—Cobbold, 1860a, 12.—Dies., 1850a, 347 (in Thryothorus hypoxanthus; Brazil).—Duj., 1845a, 433–444.—Stoss., 1892, 180; 1892, 38.

delicatulum Rud., 1809a, 373–374 (in Anas sponsa); 1819a, 99.—Blainv., 1828a, 585 (to Fasc.).—Braun, 1893a, 875; 1901, 561.—Cobbold, 1860, 10.—Dies., 1850a, 352–353.—Duj., 1845a, 449.—Kowal., 1897b, 1, 2 [reprint]; 1898h, 132.—Olfers, 1816, 44.—Odhn., 1900, 19.—Stoss., 1892, 180.—Also reported for Cygnus olor.

deliciosum Olss., 1893, 10, pl. 1, figs. 16–18 (in Larus argentatus).—Odhn., 1900, 12, 13; 1905, 311 (to Gymnophallus).

delphini Poir., 1886, 34–36, 37, pl. 4, figs. 1–3 (in Delphinus delphis).—Braun, 1892a, 673; 1893a, 874, 910; 1893, 354; 1900g, 251.—Looss, 1894a, 204; 1899b, 560 (to Brachycladium).—Mont., 1888a, 12, 38; 1893, 44, 45, 83, 86, 102, 107.—Stiles, 1895l, 219, pl. 8, figs. 1–3.—Stoss., 1892, 10 (to Cladocœlium).

dendricum Ben., 1870, 36, for dendriticum.

dendriticum Rud., 1819a, 93, 364–365 (in Xiphias gladius).—Ben., 1870, 36.—Carus, 1884, 131.—Cobbold, 1860, 22.—Darr, 1902, 698.—Dies., 1850a, 336.—Duj., 1845a, 460.—Jacoby, 1900, 10, 11.—Kroyer, 1838–40a, 597 (in Xiphias gladius).—Looss, 1899b (to Dicrocœlium).—Par., 1896, 16–18, fig. 6 to (Dicrocœlium).—Stoss., 1886, 47.

dentatum Lint., 1900a, 269, 283, 289, 294, pl. 39, figs. 64–67 (in Paralichthys dentatus); 1901b, 415, 421, 451, 483; 1905, 328, 334, 369, 372, 374, 396, 411, 413, 415 (in Coryphæna equisetis, Lophopsetta maculata, Micropogon undulatus, Paralichthys albiguttus, P. dentatus, Pomatomus saltatrix, Rachycentron canadus; Beaufort, N. C.).—Odhn., 1905, 331.

denticulatum (Rud., 1802) Rud., 1809a, 424–425, pl. 5, fig. 3 (in Anas clypeata, Sterna hirundo) to (Echinost.); 1819a, 116, 419.—Crep., 1837, 311.—Dies., 1850a, 391–392.—Duj., 1845a, 430.—Olfers, 1816, 47.—Stoss., 1892, 170 to Echinost.—Also reported for Anas sponsa.

depressum Polonio, 1859 (in Triton cristatus; Padua) teste Par., 1894, 149.—Braun, 1892a, 579, 663.

depressum Stoss., 1883, 118, pl. 3, fig. 10 (in Dentex vulgaris; Triest); 1886, 24; 1898, 39–40.—Carus, 1884, 130.

detruncatum (Braun, 1899) Braun, 1900h, 28 (in Mycteria americana), 33 to Clinost., 35 (from Tantalus loculator) to (Clinost.), 39.

dicorynum Dies., 1850a, (359, D. affine), 680, affine renamed (in Lampris guttatus).—Ben., 1870, 34.—Kroyer, 1838–40a, 598.—Stoss., 1886, 47.

dictyotus Mont., 1893, 156 (includes D. reticulatum Looss, 1885 [nec Wright]).—Braun, 1900, 26.—Looss, 1894a, 171.—MacCallum, 1899, 705.—Stiles & Hass., 1898a, 86 (D. reticulatum Looss, 1885 [nec Wright, 1879], (type of Mesogonimus).

didelphidis Par., 1896, 3–5, fig. 1a (in Didelphys azaræ).—Luehe, 1899, 532.—Stoss., 1904, 2 (didelphydis).

didelphydis Stoss., 1904, 2, for didelphidis.

diesingi Braun, 1901, 561, 563, for diesingii.

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diesingii Cobbold, 1860a, 14 (D. cochlear Dies., renamed; in Sterna cantiaca, S. minuta; Brazil).—Braun, 1901, 561, 563 (diesingi); 1902b, 56, 58 (syn. of Microlistrum cochlear (Dies., 1850a)).—Stoss., 1892, 179 (syn. of D. cochlear).

diffusocalciferum Gastaldi, 1854, 5–6, pl. 1, figs. 4–5 (in Rana esculenta).—Braun, 1893a, 870.—Cobbold, 1860a, 18.—Dies., 1855, 64 footnote (D. diffusocalciferum ranæ esculentæ); 1858e, 336 (in Pelophylax esculentus).—Stoss., 1889, 69.

diffusocalciferum ranæ esculentæ Gastaldi of Dies., 1855, 64 footnote (see D. diffusocalciferum Gastaldi).

dilatatum Fischer de Waldheim, 1840, 158 (in Gallus communis; Vilnæ).—Anacker, 1887c, 513.—Baillet, 1866b, 105.—Braun, 1893a, 874.—Caruccio, 1886b, 293.—Cobbold, 1879b, 440.—Crep., 1846, 134.—Dies., 1850a, 383–384.—Hahn & Lefèvre, 1884a, 516 (of Miram.).—Hass., 1896a, 2, 3 (syn. of Echinost. echinatum (Zed.)).—Landois, 1882, 23.—Linst., 1873, 106.—Stoss., 1892, 167 (syn. of Echinost. ech. (Zed.)); 1898, 52.—Verrill, 1870, 179.

dilutatum Schneidemuehl, 1896, 303, misprint for dilatatum.

dimidiatum Crep., 1829, 55–56 (in Acipenser sturio).—Dies., 1850a, 372 (syn. of D. grandiporum Rud.).—Duj., 1845a, 470.—Mehlis, 1831, col. 176–177.—Mol., 1859, 826 (D. grandiporum Rud.).—Odhn., 1905, 360 (syn. of Derogenes varicus (Mueller) Odhn.).

dimorphum [see below] Dies., 1850a, 353–354 [contains D. marginatum Rud., 1819a, 680, and Duj., 1845a, 446] (in Salmo carapus, Geophagus poppoterra, Chætobranchus flavescens, Crenichichla johanna, C. lepidota; Ardea, Ciconia americana, C. mycteria, Ardea cocoi; Brazil); 1855c, 55–56, pl. 3, figs. 1–6; 1855, 363; 1858e, 338.—Braun, 1892a, 699, 735; 1893a, 865, 871, 872, 873, 874; 1893, 354; 1899g, 485, 486, 490; 1900c, 25, 26, 28–29; 1900h, 4, 18, 25, 32, 33, 34, 36, 42; 1902b, 116.—Cobbold, 1860a, 10.—Gamb., 1896a, 72 (in Ardea ciconia; Brazil).—Looss, 1899b, 651 (from Ardea cocoi; Brazil).—MacCallum, 1899, 697, 706, 707.—Mont., 1893, 155 (in Gallo comune).—Sons., 1889, 283.—Stoss., 1886, 25; 1892, 181.—Also reported for Carapus brachyurus, Hydrolichus scomberoides.

dimorphum Dies., 1850a, 354, pars (in Ardea cocoi, A. sp., Mycteria americana; in Brazil, collected by Natterer).—Braun, 1899g, 490, is Clinost. marginatum (Rud., 1819a); type is no. 1493, Berlin Museum; and nos. 343, 750, and 831, Vienna Museum; 1900h, 25.

dimorphum Dies., 1850a, 353, pars, in Tantalus loculator; in Brazil, collected by Natterer.—Braun, 1899g, 490, is Clinost. sorbens Braun n. sp.; type is no. 878, Vienna Museum; 1900h, 34.

dimorphum Dies., 1850a, 354, pars, in Ciconia americana, Mycteria americana; in Brazil, collected by Natterer.—Braun, 1899g, 490, is Clinost. detruncatum Braun n. sp.; types are nos. 750 and 882, Vienna Museum; 1900h, 32.

dimorphum Dies., 1850a, 353, 354, pars, in Ardea cocoi; in Brazil, collected by Natterer.—Braun, 1899g, 490, is Clinost. dimorphum (Dies.) Braun; types are nos. 832 and 879, Vienna Museum. [Braun erroneously says n. sp.]; 1900h, 36.

dimorphum of Wagener, 1852, 555–557, pl. 16, fig. 1 (from chicken) [nec Dies.].—Braun, 1900c, 25; 1900h, 18 (= D. commutatum Dies.).—Dies., 1858e, 339 (renamed D. commutatum; in Phasianus gallus); 1855, 64, footnote 4.—Hass., 1896a, 3 (syn. of Mesogonimus commutatus (Dies.).—Rail., 1893a, 371 (to Mesogonimus).

distichum (Mueller, 1776) Zed., 1803a, 215 (in fish).—Cobbold, 1860a, 29.—Dies., 1850a, 378–379.—Rud., 1809a, 402, 440–441; 1819a, 123.

divergens Rud., 1809a, 371–372, 395 (in Blennius viviparus), Fasc. blennii Mueller, renamed; 1819a, 97, 372–373, 676.—Braun, 1892a, 636, 637, 640, 643, 646.—Carus, 1884, 129.—Cobbold, 1860a, 23.—Dies., 1850a, 337, 344.—Duj., 1845a, 461.—Fraip., 1880b, 106, 107, 265 (in Zoarces viviparus); 1881b, 2–4, 24; 1883a, 37.—Harz, 1881c, 5.—Kampmann, 1894b, 447, 449, 459, 460, 461.—Knoch, 1894a, 10.—Kroyer, 1838–40a, 138, 368, 583 (in Zo. vivip. Linn., Cottus scorpius Linn.).—(Lamouroux, 1824, 863.)—Looss, 1885b, 20.—Mont., 1888a, 42, 43, 44, 45, 46; 1893, 62.—Nord., 1840, 619.—Olfers, 1816, 45.—Stoss., 1886, 47.—Also reported for Blennius cornutus, B. gattorugine, B. tentaculatus.

dubium (Leidy, 1856) Dies., 1858e, 336.—Stoss., 1892, 181 (includes D. leidyi Cobbold).

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dujardinii Cobbold, 1860a, 29 (D. soleæ Duj., renamed) (in Solea vulgaris).

duplicatum Baer, 1826a, 124; 1827b, 558–570, pl. 29, figs. 1–15 (in Anadonta ventricosa, A. anatina).—Braun, 1892a, 769, 770; 1893a, 838; 1893b, 184.—Cobbold, 1879b, 453, 454.—Crep., 1837, 310, 325, 326.—Dies., 1836, 240; 1850a, 293 (renamed Rhopalocerca tardigrada; Regiomontii); 1855a, 380, 384; 1858d, 241, 271.—Desmonceaux, 1868, 22.—Erc., 1881e, 37, 45; 1882a, 273, 281.—Fil., 1854a, 9, 26; 1855b, 7, 20, 22, 24; 1856a, 263, 265; 1857c, 25, 27, 29, 31, 32.—Florance, 1866a, 12.—Keber, 1851a, 90.—Kuech., 1856c, 269, 277.—Lampert, 1894.—Laveran & R. Bl., 1895, 105.—Leuck., 1863, 509, 765.—Levin., 1881a, 81.—Looss, 1894a, 17, 23, 63, pl. 4, fig. 78 (syn. of Cerc. Dist. folii, C. folii, young of D. folium).—Moul., 1856a, 14, 21, 51, 56, 78, 82, 120, 129, 139, 143 (to Cerc.), 177.—Mueh., 1898, 11.—Nord., 1832a, 57; 1840, 548, 617, 630, 631.—Pag., 1857, 6, 7, 8, 9, 28–30, 46, 52, pl. 6, fig. 14 (in Anodonta cygnea); 1862, 299, 300, 301, 302, 304.—Reuss, 1902, May 19, 375–377; 1902, July, 405–406; 1903, 458–477, pl. 23, figs. 1–21; 1903, Nov. 26, 206; 1905, July 3, 63–64.—Rossbach, 1906, 420, 431.—Sieb., 1835, 56; 1854, 109, note 2.—Steenstrup, 1842, 51–55, 56.—Tennent, 1906, 651, 653.—Wagener, 1857, 22, 36, 45, 51, pl. 24.—Ziegler, 1883, 540.

echeneidis remoræ Rud., (1821–28) 163 (in Echeneis remora).—Braun, 1893a, 875.—Dies., 1855, 64, footnote 16; 1858e, 356 (in Echeneis remora).—Stoss., 1886, 47.

echinata (Sieb., 1837) Ben., 1861, 89–92, pl. 11, figs. 1–8, in Limneus auricularis; L. ovatus; L. stagnalis; Physa; Cyclas cornea.

echinatoides Dies., 1858d, 263, syn. of Cerc. (Nephrocephala) megacotyla, for echinatoides anodontæ.

echinatoides anodontæ Pag., 1857, 32 (t. h. Anodonta cygnea).—Dies., 1858d, 263 (syn. of Cerc. (Nephrocephala) megacotyla).

echinatum Zed., 1803a, 220–221 (D. anatis Gmelin, 1790) Zed., 1800, renamed; made to include Cucullanus conoideus 1782, Festucaria anatis 1788, F. boschadis 1790.—Anacker, 1887c, 513.—Baillet, 1866b, 96, 105.—Baird, 1853a, 55.—Bellingham, 1844a, 426.—Ben., 1858a, 1861a, 89–92, pl. 11, figs. 1–8 (syn. Cerc. brunnea, C. echinata); 1868, 296.—Braun, 1883b, 28; 1883a, 70, fig. 14; 1892a, 585, 595, 633, 722, 797, 807; 1893a, 821, 861, 863, 865; 1893b, 182.—Bremser, 1824c, 134; pl. 10, fig. 4–5; 1828, 134 (of birds).—Crep., 1837, 310, 311, 312, 316, 326; 1839a, 289; 1846, 134, 141, 142, 144, 145.—Cobbold, 1860a, 33.—Dies., 1836, 240; 1850a, 344, 345, 346, 383, 398 (includes Cucullanus conoideus, D. anatis; D. excavatum (Nycticoracis) Rud.; D. gruis; D. radiatum Duj.?; Fasc. anatis; F. gruis; Festucaria boschadis; Plan. teres poro simplici); 1858d, 261, 263 (larval stage=Cerc. ech.); 1858e, 344–345 (adult in Anas boschas dom. & fera; A. anser; A. cygnus fer.; A. clangula; A. clypeata; A. ferina; A. fuligula; Ardea comata; A. gardeni; A. grus; A. marila; A. moschata; A. nycticorax; A. nyroca; A. olor; A. pavonia; A. penelope; A. strepera; A. tadorna; Ciconia nigra; Carbo cormoranus; C. pygmæus; Podiceps cristatus; P. minor; Stat. juven. in Fringilla domestica; larva in Paludina vivipara; Lymnæus stagnalis; Planorbis corneus) (syn. Cerc. (Nephrocephala) ech.; 1859c, 433 (includes as hosts: Cyclas cornea; Belgia; Lymnæus auricularis; L. ovatus; L. stagnalis; Physa).—Desmonceaux, 1868, 22.—Duj., 1845a, 426–427.—Erc., 1881e, 29, 31, 48, 52, 88; 1882a, 265, 267, 284, 288, 324 (syn. Cerc. ech.).—Fil., 1854a, 19; 1855b, 25.—Florance, 1866a, 12.—Fraip., 1880c, 418.—Gamb., 1896a, 63, 72.—Generali, 1881a, 614–615 (in dogs) [Erc.]; 1882a, 70–71.—Giebel, 1857, 265.—Hahn & Lefèvre, 1884a, 516 (of Ben.) (in Canara).—Harz, 1881c, 4.—Hass., 1896a, 2, 3 (to Echinost.).—Kastenbaum, 1899, 244, fig. 33, 5, 34, 7.—Kowal., 1894, 3; 1895, 351–352, pl. 8, figs. 1–3, 12a, 13; 1896d, 7 (257) (in Corvus cornix; Anas crecca; Dublany).—Leidy, 1888, 126; 1904a, 211.—La Valette, 1855, 32.—Leuck., 1863, 82, 498, 526, figs. 143, 144, 178, 180; 1879, 15, 102, 107; 1886d, 11, 76, 80.—Linst., 1873, 1, 98, 101, 105–106 (young stage=Cerc. ech. Sieb.) (in Anas boschas); 1884, 139; 1894b, 333 (in Bythinia ventricosa, Physa fontinalis, Valvata macrostoma, Limnæa palustris).—Looss, 1892a, 14; 1893b, 813, 814; 1894a, 2, 119, 120, 124, 159, 168, 169, 170, 172, 215, 230, pl. 6, figs. 114, 115–117, pl. 9, figs. 191–192; 1895c, 74, 75; 1896b, 10; 1899b, 556; 1902m, 804, 805, 810, 811, 822.—Lutz, 1892a, 785.—Mégnin, 1884, 53.—Mol., 1858, 290; 1861, 216.—Mont., 1888a, 14, 24, 40.—Moul., 1856a, 190 (larva is Cerc. ech., teste La Valette).—Nathusius, 1835, 53.—Nord., 1832a, 47, 90, 98 (in Barsch); 1840, 621 (syn. of Fasc. trigonocephala).—Pag., 1857, 244–251 (experimental

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infections); 1858, 5–6; 1859, 58, 60.—Par., 1887, 489.—Rail., 1893a, 366.—Rud., 1809a, 418–420 to (Echinost.), 431, 432; 1814a, 102; 1819a, 115, 121, 416–417, 685–686.—Schneidemuehl, 1896, 303.—Schlotthauber, 1860, 129.—Sieb., 1835, 57; 1854, 23.—Sons., 1890, 134.—Stiles & Hass., 1898a, 87, 96 (type of Echinost.).—Stoss., 1890, 51; 1891, 111; 1892, 167 (to Echinost.); 1898, 52.—Tasch., 1879, 71.—Verrill, 1870, 179.—Ward, 1895, 341 (in Canis familiaris; duodenum).—Wedl, 1857, 245–246, pl. 1, figs. 5–6.—Zuern, 1882, 207.—Also reported for Anas clypeata; A. querquedula; Anser cinereus dom.; Ardea grus; A. nycticorax; Aythya americana; Colymbus minor; Cygnus musicus; C. olor ferus; Fiber zibethicus; Fuligula ferina; F. marila; F. nyroca; Hausente; Limnæa; Paludina vivipara; Phasianus gallus.

echinatum (Zed.) of Wedl, 1858, 245, pl. 1, fig. 5, from Phalacrocorax carbo is, according to Looss, 1899b, 681, a misdetermination.

echniferum (La Valette, 1855) La Valette, 1855, 32.—Braun, 1892a, 772.—Cobbold, 1879b, 454.—Dies., 1858d, 261, 262, 263 (larval stage=Cerc. (Nephrocephala) echinatoides); 1858e, 345–347 (in Stat. juven. in Fringilla domestica); 1859c, 433 (syn. D. militare Ben., 1858a, 84, in Scolopax gallinago; Mergus merganser; Podiceps minor; Anas boschas).—Erc., 1881e, 29, 31; 1882a, 265, 267.—Moul., 1856a, 201.—Rail., 1893a, 366 (syn. of D. echinatum).—Stoss., 1892, 171 (to Echinost.).—Ward, 1895, 341 (syn. of D. echinatum) (in Canis familiaris).—Zuern, 1882, 207.

echiniferum paludinæ Pag., 1857, 30–32, 52, pl. 2, figs. 5–6 (in Paludina vivipara); on 55, descr. of pl. 2, echiniferum.

[*echinocephala* Crep., 1837a, 326, as name of a group of distomes; quotes Nitzsch.]

echinocephalum Rud., 1819a, 115, 418 (in Falco milvus) to (Echinost.) (contains D. milvi Rud., 1809a, 429).—Braun, 1893a, 874.—Dies., 1850a, 385 (syns. D. milvi; Fasc. milvi; Plan. latiuscula Gœze).—Duj., 1845a, 425.—Stoss., 1892, 173 to Echinost.

echiuri Greef, 1879a, 130 (in Echiurus pallasi).—Braun, 1893a, 869; 1893d, 468.

elegans (Rud., 1802) Rud., 1809a, 375–376; 1819a, 100.—Braun, 1901, 561, 564, 567; 1902b, 38–39, 40 (Vienna no. 362 from Fringilla cœlebs = pars Urog. mac.; no. 363 from F. montana = pars Plagiorchis= D. cirratum Rud.), 41, 42, 45, 47, 48, 49 (to Plagiorchis) (syn. of Urogonimus macrostomus).—Cobbold 1860a, 12.—Crep., 1829, 59–63; 1837, 313, 316.—Dies., 1836, 240; 1850a, 349–350 (includes D. erraticum Rud.).—Duj., 1845a, 414–415 to (Brachylaimus).—Fil., 1855b, 8.—Mehlis, 1831, 179.—Mueh., 1896, 589.—Olfers, 1816, 44.—Schlotthauber, 1860, 129.—Sieb., 1835, 56.—Stoss., 1892, 153; 1892, 11 to (Brachylaimus); 1904, 2.

elephantis Dies., 1858, 354 (based on Jackson, 1847, 317; in Elephas indicus) (to Cladocœlium); 1858e, 354 (in Elephas indicus).—Cobbold, 1860a, 8–9 [see Fasc. jacksoni Cobbold]; 1879b, 394.—Fitz, 1876b, 513.—Stoss., 1892, 9 (to Cladocœlium).—Jackson, 1847, 317 [see Fasc. jacksoni Cobbold].

ellipticum Mol., 1858, 130 (in Acipenser nasus; Patavii); 1861, 216–217, pl. 3, figs. 1, 4.—Carus, 1884, 126.—Dies., 1850a, 351; 1858e, 351 (in Ac. nasus).—Stoss., 1886, 41, to (Echinost.).

elongatum Mehlis, 1831, 177 (in Larus argentatus, L. marinus, L. ridibundus).—Crep., 1837, 316; 1846, 139.—Dies., 1850a, 397.—Stoss., 1892, 181.—Also reported for Chroocephalus ridibundus.

embryo Olfers, 1816, 110, fig. 16 (in Perca vulgaris, P. cernua).—Cobbold, 1860a, 26; 1879b, 458.—Dies., 1850a, 365 (includes D. longicolle Crep.).—Kroyer, 1838–40a, 579 (in Acerina cernua).—Stoss., 1886, 48.

[*endemica* Sons., 1884, 17–21(not as specific name but refers to Dist. ringeri endemic in Japan and Formosa).]

endemicum Bælz, 1883, 235 (sub. D. hepatis).—Braun, 1893b, 187; 1893, 349, 352; 1893f, 386, 425 (syn. of D. japonicum R. Bl.).—Corlette, 1897a, 146.—Dunglison, 1893, 338.—Hoyle, 1890, 538.—Huber, 1896a, 577.—Ijima, 1886a, 47–59, pl. 7, figs. 1–9; 1887a, 596; 1888a, 213–215; 1889b, 137.—Jamieson, 1897b, 147 (syn. of D. sinense).—Katsurada, 1891c, 151–155.—Laspeyres, 1904a, 6.—Lockwood, 1901, 2 ed., 821.—Looss, 1907, Feb. 1, 141–147.—Mont., 1888a, 25, 36, 52, 58, 60.—Rail., 1890, 143.—Simon, 1897, 223.—Sons., 1889, 278, 279, 280, 282 (syn. D. japonicum Bl.) (in Felis dom.).—Stiles, 1904i, 35 (syn. of Opisthorchis sinensis).—Stoss., 1892, 23–24 (syns. D. sinense, *D. spatulatum* Leuck.).—Reported also for Homo sapiens, China, Giappone,

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Bengal, Tonkin, Corea, Formosa; Felis domestica).—Tyson, 1903, 3 ed., 1180 (syn. of D. sinense).—Ward, 1903, 870 (syn. of Opisthorchis sinensis).

endemicum hepatis St. Remy, 1883, 528–529, fig. 3.—La Clínica de Málaga, 1883, 309.—Cf. hepatis endemicum.

endoboluun Mont., 1891, 110, for endolobum.

endolobium Gurlt, 1845a, 288, 290 (for endolobum).

endolobum Duj., 1845a, 397 (in grenouilles vertes et rousses et la salamandre; Rennes).—Brand., 1892, 506.—Braun, 1889a, 355; 1892a, 598, 642, 700, 701, 715, 718, 719, 797, 806; 1893a, 818, 824, 860, 861, 865, 916; 1893b, 182.—Buetschli, 1872, 234–236, pl. 8.—Cobbold, 1860a, 17; 1879b, 454.—Dies. 1850a, 388–389; 1858d, 252 (larva is Cerc. (Acanthocephala) armata Sieb.); 1858e, 348, 349 (adult in Salamandra maculosa, Rhedoni; Pelophylax esculentus, Heidelbergæ; Rana temporaria; larva in Planorbis corneus, Paludina impura, Lymnæus stagnalis); 1859c, 434 (Cerc. armata).—Engel, 1866a, 8.—Erc., 1855a; 1881c, 21, 82, 84; 1882a, 257, 318, 320.—Fil., 1857c, 32.—Florance, 1866a, 11.—Gamb., 1896a, 72.—Harz, 1881c, 4.—Juel, 1889, 15.—Kampmann, 1894b, 446–454, 457, 461, 462, pl. 20, figs. 19–23.—Kath., 1894a, 146.—Kerbert, 1881a, 572.—Kowal., 1894, 3.—Lander, 1904a, 16.—Linst., 1873, 1 (young is Cerc. armata); 1887, 97–101, 102, pl. 2, figs. 1–2 (syn. D. rastellus); 1894b, 332–333 (larva in Phryganea flavicornis, Limnophilus rhombicus, L. griseus, Anabolia nervosa, Ephemera vulgata, Chloëon dipterum).—Looss, 1885b, 24; 1892, 66; 1893b, 815; 1894a, 2, 19, 26, 82, 83, 84–90, 94, 95, 122, 123, 124, 137, 140, 149, 150, 158, 159, 179, 181, 187, 188, 189, 190, 191, 202, 206, 207, 208, 214, 215, 216, 230, 231, 240, 245, 249, 259, 264, 270, pl. 2, figs. 27–29, pl. 7, figs. 153–156, pl. 8, figs. 157–162, pl. 9, figs. 176–186 (syns. D. rastellus; D. retusum Duj. of Ben.; Fasc. ranæ); (reported for Bufo vulgaris, B. variabilis, B. calamita, Rana esculenta, R. temporaria, Triton cristatus); 1896b, 95; 1899b, 589, type of Opisthioglyphe; 1905, 21 (Fasc. ranæ).—Mont., 1891, 110 (endoboluun); 1893, 28, 83.—Mueh., 1898, 28.—Olss., 1893, 11.—Pag., 1857, 19, 41, 52, pl. 5, fig. 1 (in green frogs).—Schwarze, 1885, 67.—Sons., 1893, 188 (in Rana esc. L.).—Staff., 1900, 404, 406; 1902, 724.—Ziegler, 1883, 557.—Also reported for: Gammarus pulex, Limnophilus rhombicus, Triton alpestris.

enterarchos deFil.—Par., 1896, 13, syn. of D. crassicolle Rud.

epatico Galli-Valerio, 1893a, 178, 181, pl. 2, figs. 3, 4.

ercolani Mont., 1893, 40, for ercolanii.

ercolanii Mont., 1893, 40, 42, 43, 83, 86, 95, 98, 102, 188, pl. 6, fig. 67.—Braun, 1901b, 13 (includes D. signatum Erc. [not Duj.]), 15, 16.—Looss, 1899b, 567 (in all probability identical with Telorchis linstowi).—Luehe, 1899, 528, 529, 530.—Rizzo, 1902, 28.—Stoss., 1895, 223–224, to (Dicrocœlium); 1904, 1 (includes D. signatum Erc. [not Duj.], in Tropidonotus viperinus, 5–6 (to Telorchis).—Volz, 1899, 235, 237.—Reported also for Tropidonotus natrix.

erinacei (Bl., 1847) Braun, 1889, 343.

erinaceum Poir., 1886, 37–38, pl. 4, fig. 6 (in Delphinus delphis).—Braun, 1892a, 643; 1893a, 870.—Looss, 1899b, 590 (probably an Astia).—Mont., 1893, 83, 86, 105, 106, 107.—Stoss., 1892, 22, to (Dicrocœlium).

eriocis (Mueller, 1788) Zed., 1803a, 212.—Dies., 1850a, 363 (syn. of D. hyalinum Rud.).—Rud., 1809a, 389.

erraticum Rud., 1819a, 120 (in Fringilla linaria, Motacilla alba, Parus cœruleus, P. major, P. palustris, P. pendulinus).—Braun, 1902b, 38 (of Linst., 1894, 335, syn. of Plagiorchis elegans Rud.), 42.—Dies., 1850a, 350 (syn. of D. elegans Rud.), 361 (syn. of D. macrostomum Rud.).—Duj., 1845a, 443.—Erc., 1881c, 73; 1882a, 309.—Kowal., 1896d, 3 (253) (in Picus major; Dublany).—Linst., 1894b, 335–336 (in Parus major).—Luehe, 1899, 531 (probably a Plagiorchis).—Stoss., 1892, 183 (syn. of D. macrost. Rud.).

esocis lucii Rud., 1809a, 438–439 (in Esox lucius), based on Rud., 1803, 29–30.

eurystomum Linst., 1877, 183–184 (in Anas clangula).—Stoss., 1892, 159, to (Dicrocœlium) (in Bucephala clangula).

exasperatum Rud., 1819a, 117, 421–422 (in Sorex eremita) to (Echinost.).—Braun, 1901b, 22; 1901, 341–344, pl. 19, figs. 6–7 (includes D. exasperatum Duj., 1845a; Dies, 1850a; D. (Brachylaimus) exasperatum Stoss., 1892; D. (Brachylaimus) rubens Duj., 1845a; D. rubens Dies., 1850a).—Cobbold, 1879b,

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296.—Crep., 1837, 311.—Dies., 1850a, 391.—Duj., 1845a, 411.—Stoss., 1892, 15 (in Crossopus fodiens, Sorex tetragonurus) (includes D. rubens).

excavatum (Rud., 1803) Rud., 1809a, 399–400, 404 (in Ardea ciconia); 1819a, 109 (in A. ciconia, A. nycticorax), 402–403.—Dies., 1850a, 383 ([nycticoracis] syn. of D. echinatum Zed.).—Lamouroux, 1822a, 194.—Nord., 1840, 628 (to Holost.).—Rail., 1893a, 366 (syn. of D. ech.).—Ward, 1895, 341 (in Canis familiaris) (syn. of D. ech.).—See next entry.

excavatum (Rudolphi, 1803) Blainv., 1824a, 518–519 (a holostome).—Dies., 1850a, 310 (to Hemist.).—Duj., 1845a, 375.—Mehlis, 1831, 175.—Nathusius, 1837, 53.—See foregoing entry.

excisum Rud., 1819a, 112, 411–412, 685 (in Scomber colias, at Naples; Scomber scomber, at Arimini).—Bellingham, 1844, 425.—Ben., 1870, 37.—Braun., 1892a, 654, 682.—Bremser, 1824, 134, pl. 9, figs. 19–20.—Carus, 1884, 128.—Cobbold, 1860a, 25.—Cohn, 1902k, 54, to (Lecithocladium).—Crep., 1837, 326; 1839, 289.—Dies., 1850a, 375–376; 1858e, 342, 343; 1859c, 432.—Duj., 1845a, 436.—Harz, 1881c, 5.—Kroyer, 1838–40a, 236, in Scomber scombrus.—Looss, 1899b, 640 (to Hemiurus).—Luehe, 1901, 397, 398.—Mol., 1858, 290; 1859, 841; 1861, 211–212.—Mont., 1891, 497, 500, 502.—Olss., 1868, 51; 1876, 21.—Sons., 1891, 259 (in Scomber scombrus).—Stoss., 1883, 116; 1886, 15.—Wagener, 1860, 165, 166, 172–176, pl. 8, figs. 8–14.

exiguum Mueh., 1898, 17, 25, 89–90, fig. 11 (in Circus rufus).—Looss, 1899b, 564 (type of Holometra Looss).

expansum (? Creplin, 1842) Mont., 1892, 714 [speaks of M. expansum on same page], probably lapsus for expansum Crep., 1842.

exspinosum Hausmann, 1896a, 391; 1897b, 4, 6, 20, 22, pl. 1, figs. 4–5 (in Barbus fluviatilis).—Looss, 1899b, 598 (to Asymphylodora).

fabenii Mol., 1859, 289 (in Cantharus vulgaris; Batavii); 1858, 289; 1861, 202–203.—Carus, 1884, 130.—Dies., 1859c, 428–429.—Sons., 1890, 142–143 (in Cantharus lineatus Mont.).—Stoss., 1886, 27.

factum Mont., 1893, 32, misprint for fractum.

falcolacæ Leidy, MS., in Stiles & Hass., 1894d, 250 (name found in bottle in Leidy collection; is probably D. trapezium Leidy).

falconis chrysaëti Rud., 1809a, 429 (=D. felleum Falconis chrysaëti Viborg).

falconis milvi Rud., 1809a, 429–430, for F. milvi Gmelin.

falconis rufi Rud., 1819a, 119 (in Falco rufus; Cat. Ent. Vien.).—Dies., 1850a, 346 (syn. of D. lineola).—Duj., 1845a, 442.—Stoss., 1892, 183 (syn. of D. lin.).

fallax Rud., 1819a, 117, 120 (in Uranoscopus scaber; Naples).—Carus, 1884, 126.—Cobbold, 1860a, 37, to Echinost.—Dies., 1850a, 392.—Duj., 1845a, 432.—Looss, 1899b, 576, 581, 582; 1901, 655, 658; 1902m, 789, 804, 805, 811, 822, type of Anisogaster 1901 [not 1863] and Anisocladium, 1902.—Stoss., 1886, 34; 1890, 41.—Wagener, 1860, 170.

farionis (Mueller, 1788) Bl., 1891, 481–483, fig. 38 (includes F. truttæ Frœlich, D. laureatum Zed.).—Braun, 1893b, 179, 184.—Hausmann, 1897b, 4, 6, 17, 20, 22, 35 (in Thymallus vulgaris).

fasciatum Rud., 1819a, 97, 373–374, 595 (in Labrus tinca, L. merops, Perca marina; Naples).—Barbagallo & Drago, 1903, 410 to (Dicrocœlium) (in Crenilabrus cœruleus; Catania; Serranus scriba).—Braun, 1891d, 421; 1892a, 720, 765; 1893a, 910; 1893b, 184 (in Labrus merula).—Carus, 1884, 130.—Cobbold, 1860a, 23.—Dies., 1850a, 344 (includes D. labri Rud., 1819a, 122).—Duj., 1845a, 456.—Lint., 1900, 291.—Looss, 1899b, 571 (this form as described by Stoss., 1885, belongs to Creadiinæ, possibly to Creadium); 1901, 399, 401.—Mont., 1888a, 66; 1893, 192, pl. 1, fig. 15.—Odhn., 1901, 484, 485, 486, 487, 488, 490, 491, 493, 496, 497; 1902, 160.—Olss., 1868, 32.—Sons., 1890, 141 (in Serranus scriba L.); 1891, 257.—Stoss., 1885, 160; 1886, 32; 1892, 64; 1898, 46; 1902, 578.—Will.-Suhm, 1870, 8; 1871, 182, pl. 11, fig. 7.—Also reported for Anguilla vulgaris, Crenilabrus melops, C. tinca, Ctenolabrus rupestris, Labrus mixtus.

felineum Rivolta, 1884, 20–29, 1 pl. (in cat and dog; Italy).—Askanazy, 1900b, 491 (cats and dogs; Italy), 494 (felinum); 1900c, 72–80; 1901, 72, 73, 74, 75, 76, 77, 78, 79, 80 (cases in man); 1906, 127–131 (in Idus idus, Leuciscus rutilus).—Braun, 1893, 349, 351, 352, 353; 1893f, 386, 387, 388, 390, 391, 392, 422, 423, 424, 425 (includes D. conus Gurlt, Sons., D. lanceolatum Crep. p.p., Sieb., van

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Tright; in dogs and cats), 426, fig. 3 (extensive account of early synonymy); 1894, 129; 1894i, 602, 605, 606; 1895b, 148–151, figs. 66–68; 1900g, 250; 1901e, 314, 315, 338; 1902b, 5.—Kholodk., 1897, v. 27 (1), 185–186 (in man).—Huber, 1896a, 576 (syn. of D. sibiricum).—de Jong, 1887a, 57ff (in dog; Holland); 1886–87; 1887b, 223, 224; 1896a, 1, 2, 3, 4, 9, 10, 11, fig. 4.—Kamensky, 1900a, 1–23 (syn. of Opisthorchis tenuicollis Rud., Mueh.); 1900b, 1–23; 1901a, 323–324.—Kholodk., 1898, 26, 29, pl. 9, figs. 10–12; 1899a, 152.—Kowal., 1898g, 74; 1898h, 144 (41).—Laspeyres, 1904a, 513 (felinum).—Linst., 1903, 279.—Looss, 1896b, 58, 59; 1899b, 530, 674, 675, 676; 1905, 89 (to Opistorchis).—Moniez, 1896, 86, 123, 136–141, fig. 26.—Mueh., 1898, 15, 16, 21 (syn. of D. tenuicolle), 24.—Rail., 1893a, 361.—Ratz, 1898, 67–69, fig. 1 (felinum); 1900, 250; 1900, 141–142; 1900, 532.—Rindfleisch, 1904, March, 346 (in man); 1904, 8.—Roth, 1904, 93–94 (in man, infection from Leuciscus rutilus).—Schneidemuehl, 1896, 302.—Shaw, 1901, 1027.—Simon, 1897, 223.—Sons., 1889, 276, 280; 1889, 281 (syn. of D. conus Crep.); 1897, 254, 255, 256–257 (in Canis fam.; Pisa); 1897, Apr., 221.—Stiles, 1894n, 358–360.—Stiles & Hass., 1894e, 426–427, figs. 5–8; 1898a, 85 (type of Opisthorchis).—Tyson, 1903, 3 ed., 1181 (in cats and man).—Ward, 1895, 152; 1895, 238 (man, cat, dog; includes D. lanceolatum of cats and dogs), 243–244 (includes as syns. D. conus Gurlt nec Crep.; D. lanceolatum Sieb., 1836; D. truncatum Rud. pars.); cat, dog, and glutton; Europe; man; Siberia), 328 (in Homo; biliary ducts), 341 (in Canis familiaris; biliary ducts); 1895, (3), Mar., 152–158, 1 fig.; 1895, 8 pp.; 1895, 304–309; 1901, 180 (of Ward syn. of Opisthorchis pseudofelineus).—Weichselbaum, 1898, 315.—Also reported for Gulo borealis.

felineum of Ward, 1895, 152–158, 1 fig.; 1895 (nec Riv.), 239, fig. 1, 240, fig. 2, 242, fig. 3 (=Opisthorchis pseudofelineus); 1896, 5 Nov., 709; 1901, 180.

felinum (*sibiricum*) Askanazy, 1900b, 491–502, for felineum, cases in man; 1900c, 711, 712.

felinum (see D. felineum; misprint in Ratz, 1898, 67).

felleum falconis chrysaeti Viborg, 1795, 243 (renamed D. Falconis chrysaëti by Rud.).—Dies., 1850a, 376 (syn. of D. crassiusculum).

fellis Olss., 1868, 44–46, pl. 5, fig. 94 (in Anarhichas lupus).—Braun, 1893a, 875.—Jacoby, 1899c; 1900, 1, 12–16, 20, figs. 8–12.—Lint., 1900, 291.—Luehe, 1900, 504.—Odhn., 1905, 307, 309, 310.—Stoss., 1886, 24 (in Anarrhichas lupus).

ferocis Mont., 1888a, 14, apparently misprint for ferox.

ferox (Rud., 1795) Zed., 1803a, 221.—Baird, 1853a, 56, includes Echinorhynchus ardeæ nigræ Braun.—Ben., 1868, 295, 296–299, pl. 1, figs. 1–5.—Braun, 1892a, 568, 583, 584, 721; 1893a, 877, 881.—Bremser, 1824, pl. 10, figs. 6–11.—Crep., 1837, 311, 312, 316, 326.—Dies., 1850a, 387–388 (syns.: Plan., D. ardeæ Zed.; D. ardeæ stellaris Rud.; Echinorhynchus ardeæ nigræ Braun; Fasc. ardeæ Gmelin).—Duj., 1845a, 429–430.—Gamb., 1896a, 63.—Giebel, 1857, 265.—Kowal., 1896d, 253 (3) (in Ciconia alba; Dublany).—Leuck., 1886d, 11; 1879, 14.—Linst., 1873, 106 (in Ciconia alba).—Looss, 1892a, 14.—Mayer, 1841a, 4.—Mol., 1858, 130; 1861, 219.—Mont., 1888, 14.—Nathusius, 1837, 53.—Nord., 1832a, 90.—Olfers, 1816, 47.—Olss., 1876, 22.—Rud., 1803, 90; 1809a, 426–427, to (Echinost.), 433; 1814a, 102; 1819a, 116–117, 120, 419–420.—Villot, 1875, 473.—Also reported for Ardea ciconia, A. nigra, A. stellaris, Ciconia nigra.

ferruginosum Linst., 1877, 184–185, pl. 14, figs. 25–27 (in Barbus fluviatilis).—Braun, 1892a, 587, 729, 766.—Hausmann, 1897b, 30.—Looss, 1894a, 24, 25, 26, 31, 32, 123 (syn. of D. perlatum).—Stoss., 1886, 48.

filicolle (Rud., 1819a) Ben., 1858a, 1861a, 104–107, 111, 187, 189, 195, 199, 200, 201, pl. 10, figs. 1–10 (includes D. okenii); 1870c, 137.—Braun, 1892a, 698–727.—Carus, 1884, 128.—Cobbold, 1860a, 31 (in Brama raii), to Köllikeria as type.—Leuck., 1879, 137; 1886d, 106.—Mont., 1888a, 9, 18, 52, 62, 93, 104; 1893, 150.—Sons., 1890, 143 (of Wagener).—Stoss., 1886, 17.

filiferum Sars, 1885, 222, pl. 38, figs. 19–21 (in Nematoscelis megalops S., Thysanoëssa gregaria S.; South Atlantic Ocean).—Braun, 1893a, 836, 837, 853.—Linst., 1888, 17.—Mont., 1893, 40, 42, 43, pl. 5, fig. 61.

filiforme Rud., 1819a, 112, 411, 772 (in Cepola tænia at Arimini; Cepola rubescens).—Braun, 1883a, 41; 1892a, 672.—Carus, 1884, 131.—Cobbold, 1860a, 28.—Dies., 1850a, 375.—Duj., 1845a, 460–461.—Stoss., 1886, 48.—Will.-Suhm, 1870, 8; 1871, 182.

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filum Duj., 1845a, 418 (in moineaux at Rennes), to (Brachylaimus).—Cobbold, 1860a, 15 (in Fringilla dom.).—Dies., 1850a, 376.—Hausmann, 1897b, 28.—Stoss., 1892, 152.

fimbriatum Busch, 1851, 99, pl. 15, fig. 12 (in Sagitta).

flagellatum Moniez, 1891, 27 (in Gymnotus electricus); 1896, 144.

flavescens Pag., 1857, 34–35, pl. 3, fig. 14 (in Bulimus radiatus).—Braun, 1892a, 642.—Dies., 1858d, 278 (to Cercariæum).

flavescens Ben., 1870, 47, pl. 5, fig. 4,(in Gobius jozo; G. minutus).—Stoss., 1886, 21.

flavocinctum Linst., 1879, 183–185 (in Anguis fragilis).—Stoss., 1895, 230; 1897, 9 (= D. crassicolle); 1898, 32.

flexum Lint., 1892, 98–99, pl. 6, figs. 36–44 (in Oedemia americana).

flexuosum Rud., 1808a, 346; 1809a, 50, 389–391 (in Talpa europæa); 1819a, 105.—Bellingham, 1844a, 424.—Braun, 1891d, 421; 1901a, 33.—Cobbold, 1860a, 7; 1879b, 296.—Dies., 1850a, 360; 1858e, 341 (in Talpa europæa).—Duj., 1845a, 398–399.—Hausmann, 1897b, 28.—Looss, 1899b, 562, type of Omphalometra.—Mueh., 1896, 244–248, figs. 1–8; 1896, 588; 1898, 16, 28.—Olfers, 1816, 44.—Stoss., 1892, 26 (in Talpa europæa; Greifswald, Copenhagen, Rennes).

fœcundum Lint., 1900, 269, 282, 289–290, pl. 36, figs. 27–35, pl. 37, figs. 36–37 (in Lopholatilus chamæleonticeps); 1901, 415, 419, 432, 472.

foliaceum Mol., 1859, 288 (in Gobius paganellus; Batavii); 1861, 199.—Carus, 1884, 131.—Dies., 1859c, 428.—Stoss., 1886, 48.

foliatum Lint., 1898, 532–534, pl. 49, figs. 3–5, pl. 50, figs. 1–3, pl. 51, figs. 1–4 (in Mola mola); 1900, 282; 1901, 415, 422, 466; Looss, 1902m, 644, to Orophocotyle.

foliiforme Crep., 1846, 149 (in Squalus griseus); 1837, 317.

folium Olfers, 1816, 45, fig. 15 (t. h. Esox lucius).—Bell, 1887a, 117.—Braun, 1892, 44; 1892a, 642, 663, 674, 697, 710, 716, 720, 723, 737, 746, 783, 785; 1892g, 461–463; 1893a, 876; 1893d, 467; 1899, 2; 1899g, 490, 492, type of Phyllodist.; 1899b, 721; 1901b, 9, 10, 12.—Cobbold, 1860a, 23.—Cohn, 1896, 240.—Darr, 1902, 688.—Dies., 1850a, 343 (in Esox lucius; Berlin); 1858e, 335.—Duj., 1845a, 464.—Fil., 1855b, 25.—Hausmann, 1897b, 15.—Kroyer, 1846–53a, 253.—Looss, 1893b, 813, 814, 815; 1894a, 2, 18–24. D. duplicatum [Rhopalocerca tardigrada], viewed as young form, 28, 29, 31, 58, 62, 63, 64, 110, 125, 136, 137, 138, 142, 159, 161, 167, 174, 179, 181, 183, 185, 186, 194, 197, 200, 204, 206, 211, 215, 217, 227, 230, 269, 270, 275, pl. 1, figs. 19–22, pl. 4, figs. 75–80 (reported for Acerina cernua; Cottus gobio; Salmo umbla; Thymallus vulgaris; Trutta variabilis); 1899b, 605, type of Spathidium; 1902m, 476, 477.—Mont., 1888a, 7, 55; 1893, 83, 102, 107.—Mueh., 1898, 11, 15, 28.—Odhn., 1902, 64, 65.—Rossbach, 1906, 377, 388.—Rud.,1819a, 96–97, 371–372, 588.—Spengel, 1892.—Ssinitzin,1901, v. 24, 25 Nov., 689–694 (in Dreissenia polymorpha); 1902, 359–360; 1904, 768, figs. d, e.—Staff., 1902, 481, to (Spathidium), in Ameiurus nebulosus.—Stoss., 1886, 48.—Wagener, 1855, 1857, 26, 27.—Will.-Suhm, 1873.—Zschokke, 1884.

formosum Sons., 1890, 134–136 (in Grus cinerea Bechst.); 1891, 2 Mch., 291.—Braun, 1892a, 698; 1901, 944; 1902b, 21, 22.—Mont., 1893, 82, 148; 1896, 166.—Ofenheim, 1900, 160.—Stoss., 1892, 143 (to Polyorchis).

fractum Rud., 1819a, 107, 397 (in Sparus salpa; Naples).—Braun, 1893a, 910.—Carus, 1884, 124.—Cobbold, 1860a, 28.—Dies., 1850a, 377–378.—Duj., 1845a, 458.—Jacoby, 1900, 4.—Looss, 1894a, 170, 204, 219.—Luehe, 1900, 487.—Mont., 1892, Oct. 7, 174, 175; 1893, 13, 23, 24, 32 (factum), 33, 40, 41, 42, 43, 61, 79, 82, 83, 85, 87, 88, 91, 94, 96, 98, 102, 105, 106, 107, 114, 120, 141, 146, 167–172, 175, 186, pl. 1, fig. 9, pl. 5, fig. 62, pl. 6, figs. 81–86, pl. 7, figs. 110–111, pl. 8, figs. 112, 114.—Nord., 1832a, 35.—Odhn., 1905, 328.—Sons., 1890, 139–140 (in Box salpa Cuv.); 1891, 262.—Stoss., 1886, 49, to (Podocotyle); 1887, 184; 1892, 65.

fragile Lint., 1900, 269, 282, 295, pl. 39, figs. 68–70 (in Mola mola); 1901, 415, 420, 466.—Type of Stenocollum 1904.

fraternum Looss, 1894d, 42–48, pl. 2, figs. 13–15 (in Pelecanus onocrotalus); 1895a, 1896b, 60–63, 101, 154, 156, pl. 4, figs. 36, 37 (in pelican, Alexandria); 1899b, 535, 550, 556, to Cœnogonimus; 1902m, 804, 805, 886, 887.—Braun, 1901e, 334, 336, 338.—Jacoby, 1900, 23.—Jægers., 1898, 9, 12.—Luehe, 1899, 539, to Cotylogonimus (Cotylogonimus).—Moniez, 1896, 143–144.—Mueh., 1898, 81, 82 (considers D. concavum a Mesogonimus and more or less related to fraternum and heterophyes).—Sons., 1896, 314.—Stoss., 1898, 42.

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fralichii Kowal., 1894, 3, host not given (to Echinost.); 1895, 353–355, pl. 8, figs. 4–8, 12 b; 1895, 372–390, pl. 8, figs. 1–6.

fuligulæ ferinæ Dies., 1858e, 355 (in Anas ferina; Ireland) based on Bellingham, 1844, v. 13, 430.—Stoss., 1892, 167 (to Echinost. echinatum).

fulvum Rud., 1819a, 98, 374–375 (in Gadus molva at Naples; G. mediterraneus).—Bellingham, 1844a, 423.—Carus, 1884, 131.—Cobbold, 1858b, 157, pl. 31, figs. 6–8 (in Moletta quinquecirrata) (includes D. simplex Rud.; Fasc. bramæ Mueller); 1860a, 23.—Dies., 1850a, 345 (in Lota molva; Naples); 1858e, 335 (in Raja batis).—Duj., 1845a, 466.—Kroyer, 1843–45a, 166 (in Lota molva).—Linst., 1903, 354.—Stoss., 1886, 49.—Also reported for Gadus mustela Linn.; Molva vulgaris; Motella mustela.

furcatum Bremser in Rudolphi, 1819a, 107, 396–397, 683–684 (in Mullus surmuletus, M. rubescens at Arimini; Gadus molva at Naples); 1824, 133.—Braun, 1892a, 576, 584; 1893a, 910.—Carus, 1884, 124.—Cobbold, 1860a, 29.—Crep., 1837, 310.—Dies., 1850a, 378 (in Mullus barbatus; M. rubescens; Armini; Lota molva, Naples; Coryphæna hippurus, Brazil).—Duj., 1845a, 402.—Eysenhardt, 1829, 145.—Hausmann, 1897b, 35.—Kroyer, 1838–40a, 581; 1843–45a, 166 (in Mullus surmuletus; Lota molva).—Looss, 1902m, 771, 772 (undoubtedly represents a new genus).—Luehe, 1900, 487, 488, 490, 491, 492.—Mont., 1888a, 12; 1893, 192, pl. 1, fig. 18.—Odhn., 1905, 325, 326.—Stiles & Hass., 1898a, 92.—Stoss., 1883, 116, 1886, 16.—Also reported for Box salpa; Molva vulgaris.

furcigerum Olss., 1868, 26, pl. 4, fig. 72 (in Pleuronectes limanda, P. limandoides).—Braun, 1892a, 643, 728, 752; 1893a, 910.—Levin., 1881a, 12, 61–64, 67, 76, 77, pl. 2, figs. 5–6 (in Cottus scorpius, at Egedesminde; Pl. limanda; P. limandoides).—Linst., 1890f, 179.—Mont., 1893, 61, 95, 105, 193.—Odhn., 1905, 302, 305 (type of Steringophorus).—Staff., 1904 (type of Leioderma n. g., nec Suhm, 1873).—Stoss., 1886, 28 to (Dicrocœlium).

[*fusca* Sluiter, 1900, 7 (a tunicate).]

fuscatum Rud., 1819a, 101, 384–385 (in Tetrao coturnix; Ancona).—Braun, 1901, 561, 564; 1901, 941; 1902b, 114, 115 (to Harmost.).—Cobbold, 1860a, 11; 1879b, 440.—Dies., 1850a, 353.—Duj., 1845a, 445.—Stoss., 1892, 182; 1892, 40.

fuscescens Rud., 1819a, 113, 413 (in Sparus dentex; Arimini).—Carus, 1884, 130.—Dies., 1850a, 377 (in Dentex vulgaris; Arimini).—Luehe, 1900, 490.—Mol., 1859, 833, 838–840, 845, pl. 1, fig. 1 (in Dentex vulgaris; Padua).—Mont., 1893, 40, 41, 42, 43, 82, 83, 95, 102, 177–179, pl. 5, fig. 63.—Stoss., 1885, 159; 1886, 27; 1886, 59 to (Dicrocœlium); 1898, 45 (in Dentex vulgaris; Triest).—Also reported for Caranx trachurus.

fuscum (Bosc, 1802) Poir., 1885, 6, 12–13, pl. 23, fig. 7.—Braun, 1893a, 872, 873.—Buttel-Reepen, 1902, 167, pl. 6, fig. 17.—Reported for Doras sp.

fusiforme Zed., 1800a, 163 (in Upupa ep.), 171–173, Fasc. upupæ Schrank, 1790, renamed; 1803a, 210.—Braun, 1901, 561.—Dies., 1850a, 351 (syn. of D. involutum).—Rud., 1809a, 377.

gadi Dies., 1855, 64, based on Bellingham, 1844a, 428, t. h. Gadus æglefinus; Ireland.

gadi æglefini Dies., 1858e, 341, based on Bellingham, 1844, 428 (renamed D. anonymum Dies.)

galactosomum Leidy, 1888i, 166–167 (in Labrax lineatus; U. S. A.); 1889, 611; 1904a, 216–217.—Braun, 1893a, 872; 1900h, 43.—MacCallum, 1899, 704, 707.

gammari Rentsch, 1860, 18, 35–50, pl. 12, figs. 7–12, 15–16 (in Flohkrebs, Gammarus ornatus).

gammari Linst., 1877, 186, n. sp.; 1878a, 315 (in Gammarus pulex).

gammari ornati Rentsch, 1860, in explanation of fig. 2, pl. 12 (D. gammari Rentsch, 1860, renamed).

gastrocolum Leidy, 1891a, 414–415 (in Trichiurus lepturus; U. S. A.); 1904a, 235–236.—Stiles & Hass., 1894, 414.

gelatinosum Rud., 1819a, 102, 386–387 (in Testudo mydas; Arimini).—Braun, 1899b, 715, 716–717; 1901b, 16, 18, 19, 29–34, figs. 6, 12, 19; 1902b, 26.—Carus, 1884, 129.—Cobbold, 1860a, 19.—Dies., 1850a, 356.—Duj., 1845a, 451.—Looss, 1899b, 570, 579, 580; 1901l, 563, 564, 565; 1902m, 445 (to Rhytidodes), 446, 451, 452, 454, 455, 456, 457.—Mont., 1888a, 38; 1892, 715; 1896, 165; 1903a, 86, 102.—Par., 1846.—Sons., 1890, 4 May; 1893, 5 Feb.; 1893, 183, 184

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(in Chelonia caretta L.).—Stoss., 1895, 37; 1895, 226–227; 1898, 43; 1904, 3.—Also reported for Chelone mydas, Emys lutraria, Halichelys atra, Podocnemis expansa, Thalassochelys caretta L., T. corticata.

gelatinosum Rud. of Poir., 1886, 33–34, pl. 3, fig. 6 (nec Rud.) (in Cistudo lutraria).—Braun, 1899b, 716 (syn. of D. poirieri Stoss.); 1901, 13, 19.—Looss, 1899b, 567 (possibly identical with Telorchis linstowi).—Luehe, 1899, 528.—Stoss., 1904, 3 (syn. of D. poirieri Sons., 1893, Telorchis poirieri Stoss.).

geminum Looss, 1896b, 50–52, 54, 58, 59, pl. 4, figs. 25–27 (in Milvus parasiticus; Cairo); 1899b, 675 (to Opisthorchis).

geniculatum Dies., 1850a, 373–374(in Physophora tetrasticha; Naples) (D. physophoræ Fil., renamed).—Cobbold, 1860a, 30.—Mont., 1888a, 77; 1888, 195, 196; 1893, 124.—Moul., 1856a, 217.

genu Rud., 1819a, 107–108, 397–398 (in Labrus luscus; Naples).—Braun, 1893a, 873.—Carus, 1884, 131.—Cobbold, 1860a, 27.—Dies., 1850a, 368–369.—Duj., 1845a, 462.—Looss, 1901d, 399.—Nord., 1832a, 36.—Odhn., 1901, 484, 487, 490, 496.—Stoss., 1886, 49.

giardi Stoss., 1898, 50–51, for giardii.

giardii Stoss., 1889, 25(3), pl. 13, fig. 56 (in Naucrates ductor; Triest); 1898, 50–51 (giardi).—Braun, 1892a, 583, 673; 1893a, 910.—Buttel-Reepen, 1902, 202.—Mont., 1893, 29, 43.

gibbosum (Rud., 1802) Rud., 1809a, 399, pl. 6, fig. 8 (in Esox belones); 1819a, 107, 395–396.—Bellingham, 1844a, 424.—Carus, 1884, 124.—Cobbold, 1860a, 28.—Crep., 1837, 326.—Dies., 1850a, 378; 1858e, 343 in Gadus æglefinus, Ireland; 1859c, 433.—Duj., 1845a, 402.—Harz, 1881c, 5, 11.—Kroyer, 1846–1853a, 273 (in Belone rostrata Fabricius).—Luehe, 1900, 487, 492; 1901, 480.—Mol., 1858, 290 (in Belone acus; Patavii); 1861, 213.—Odhn., 1905, 356, 357 (to Lecithaster).—Olfers, 1816, 46.—Stiles, 1901, 193.—Stiles & Hass., 1898a, 92.—Stoss., 1886, 49.—Also reported for Colymbus cristatus.

giganteum Dies., 1858e, 331–332 (gigantica, 1855, renamed).—Bassi, 1875b, 508.—Braun, 1892a, 650 (gigantea), 568, 674; 1893d, 466; 1903a, 875, 910.—Leuck., 1863, 530.—Stiles, 1898a, 49.—Stoss., 1892, 9 (to Cladocœlium).

gigas Nardo, 1827, 68–69 (in Proctostegus proctostegus, teste Braun); 1833, 523; 1874–1875 or (1876), 265–266.—R. Bl., 1888a, 543; 1891, 479–481, fig. 37.—Braun, 1892a, 632; 1893a, 873; 1893b, 184 (in Proct. prototyphus).—Buttel-Reepen, 1902, 167, 168, 169, 171, 172, pl. 6, figs. 10, 10a.—Carus, 1884, 126.—Cobbold, 1858, 167; 1860a, 28; 1879b, 460.—Crep., 1837, 310.—Darr, 1902, 664, 665, 666, 669, 671, 697.—Dies., 1850a, 373.—Hoyle, 1890, 540.—Luehe, 1901, 483, "D. gigas" (from Luvarus imperialis), to Accacœlium raynerianum, 485.—Mont., 1889, 322; 1891, 500, 520; 1893, reprint, 7–9.—Par., 1902, 6 (in L. im.; Portoferrajo).—Poir., 1885, 6.—Setti, 1894, (19 pp.), pl. 28; 1894, 17 pp., pl. 28, 6 figs.; 1895, 316; 1895, 306; 1895, Feb. 28, 270; 1895, 367.—Stoss., 1886, 50.—Also reported for Ansonia cuvieri.

glabrum Crep., 1846, 148 (in Salamandra maculosa).—Dies., 1850a, 398.—Stoss., 1889, 70.

glandulosum Looss, 1896b, 64–68, 69, 71, 72, 76, pl. 5, figs. 41–44 (in Taphosus nudiventris; Ghizeh); 1898, 453, 454, 455, 456, 457, 458, figs. 1, v; 1899b, 547, 716, 717 to Lecithodendrium.—Stiles, 1901, 200.

glauci Bergh, 1884, 18, pl. 10, figs. 5–17 (in Glaucus atlanticus, etc., teste Braun).—Linst., 1888, 17.

globicaudatum Crep., 1849a, 64.

globiferum Lamarck, 1816, 182 for D. globiporum.—Nord., 1840, 618 (syn. of Fasc. globifera).

globiparum Ehrenb., 1837b, 199, for globiporum.

globiporum (Rud., 1802), Rud., 1809a, 364–367 (includes Fasc. bramæ Mueller; F. lanceolata (bramæ) Schrank, 1790; F. tincæ Modeer, 1790; F. longicollis (carpionis) Frœlich, 1791; D. cyprinaceum Zed., 1800; D. carinatum Zed.), 410, 414, 441; 1819a, 96.—Ben., 1858a, 1861a, 100, 191, 197, 203.—Braun, 1883a, 52; 1892a, 635, 695, 699, 711, 746, 747, 756, 779, 780, 783, 785, 788, 790; 1893a, 865, 879, 883.—Burm., 1835b, 187–194, pl. 2, figs. 1–6.—Cobbold, 1860a, 21.—Condorelli-Francaviglia, 1898, 2, 4, 5–7.—Crep., 1837, 310, 313, 322, 323, 324, 327, 328, 329; 1846, 152, 153, 154.—Dies., 1850a, 341 (includes Fasc. *bramæ Mueller*, F. lanceolata Schrank, F. longicollis Frœlich, **F. globipora**

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globiporum tincæ Rud. of Dies., 1850a, 395 (syn. of D. perlatum Nord.).

globocaudatum Crep., 1825, 49–50 (in Corvus cornix); 1849a, 64.—Braun, 1902b, 44 (not Linst., 1883).—Cobbold, 1860a, 13.—Dies., 1850a, 351; 1858e, 337 (in Corvus glandarius).—Duj., 1845a, 413–414.—Fil., 1855b, 8.—Linst., 1878, 99; 1883, 307–308; 1886, 31.—Stoss., 1892, 153 (syn. of D. cirratum Rud.).

globosum Ben., 1858a, 1861a, 193 (refers to Sieb.).—Braun, 1901c, 311 (as a name of Dies. for D. orbiculare), 312.—Jackson, 1888, 647.

globulus Rud., 1814a, 104 (in Anas fuligula); 1819a, 109, Greifswald, 401–402.—Bellingham, 1844a, 425.—Braun, 1893a, 879; 1901, 561, 564; 1902b, 19, 152 (includes D. gl. Braun, 1901, 564; Crep., 1846, 142, 143, 145, 146; Dies., 1850a, 365, and 1858e, 341; Duj., 1845a, 450; Rud., 1819a, 109, 401; Stoss., 1892, 40), 155 (to Psilost., Looss) [does not use name globulus in combination with P.].—Cobbold, 1860a, 11.—Crep., 1846, 142, 143, 145, 146.—Dies., 1850a, 365; 1858e, 341 (in Anas Cygnus ferus).—Duj., 1845a, 450.—Olfers, 1816, 46.—Stoss., 1892, 182.—Also reported for Alca torda, Anas fuligula, A. marila, A. sponsa, Dafila acuta, Fuligula cristata, F. marila, Harelda glacialis, Mergus merganser, M. serrator.

gobii Stoss., 1883, 116–117, pl. 2, figs. 6–7 (in Gobius jozo; Triest); 1886, 29; 1890, 41; 1898, 45; 1904, 12 (to Helicometra).—Braun, 1891d, 421; 1892a, 711, 765.—Carus, 1884, 124.—Condorelli-Francaviglia, 1898, 7.—Looss, 1901d, 399.—Mont., 1893, 83, 95, 102.—Odhn., 1901, 494, 495; 1902, 160.—Sons., 1891, 258.

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gom Leuret, 1840, 45–50, pl. 11, figs. 3–5, 8–9c–d; pl. 12, figs. 1, 5c–e (in Gobius nanus [called also D. gobii minus in description of plates].—Also reported for Crassostreus spinachia.

gom. minus Leuret, 1840, in descr. of plates for D. gobii.—Odhn., 1901, 495.

gracilis Ben., 1858e, 95–97, 1 pl., figs. 1–5 (in liver of a Balæna).—1858f, 282; 1870, 305.—Braun, 1891, 423; 1892a, 589, 721; 1893a, 875; 1893d, 466; 1902, Nov. 27, 809–815, 1 pl., to Lecithodesmus; 1902, Dec. 30, 841–842; 1905, July, 51, 53.—Goddard, 1900a, 5.—Dies., 1858e, 336–337 (in Balæna borealis [Balænoptera rostrata Fabricius].—Hahn & Leleup, 1884a, 516.—Jægers., 1891, 122.—Leuckart, 1891, 71–73.—Odhn., 1905, 344, 347 (to Lecithodesmus).—Stoss., 1892, 34–35 (in Balæna mysticetus, Balænoptera rostrata).—Villot, 1876, 2.

gracilis Leidy, 1856 (Dies., 1858e, 336 (in Esox spec., Pomotis vulgaris).—Braun, 1893a, 871; 1900b, 43, 44, 45.—MacCallum, 1899, 704.—Mont., 1893, 155.—Stoss., 1886, 50.—Also reported for Apogon anullorum.

gracile of Wright, 1879, 9 (in Perca flavescens).—Braun, 1899g, 491 (probably syn. of Clinost. marginatum Rud.; 1900b, 43, 45.

gracile of Lint., 1898, 523–524, pl. 46, figs. 6–8 (in Lepomis auratus, Eupomotis pallidus, Chænobryttus gulosus).—Braun, 1899g, 491 (probably syn. of Clinost. marginatum Rud.; 1900b, 44, 45 (thinks Poirier's form, 1886, 39, pl. 3, fig. 8, from Axinurus dugesi, may belong here).

gracile of MacCallum, 1899, 704, pl. 39, fig. 7.—Braun, 1900b, 44, 45, probably syn. of Clinost. marginatum.

gracilescens Rud., 1819a, 111, 409 (in Lophius piscatorius; Trieste).—Braun, 1893a, 886.—Bremser, 1824c, pl. 9, figs. 17–18.—Cobbold, 1858b, 161, pl. 32, figs. 33–37 (in Lophius piscatorius; 1879b, 462.—Crep., 1837, 326.—Dies., 1850a, 374–375; 1858e, 361 (in Loph. pisc.) to Rhipidocotyle).—Duj., 1845a, 462.—Kroyer, 1838–40a, 471.—Linst., 1878a.—Maddox, 1867, 97.—Stoss., 1898, 61.—Tennent, 1906, 638 (to Gasterost.).—Wagener, 1860, 189.

grande Rud., 1819a, 676–677 (in Platalea ajaja; Brazil).—Braun, 1901g, 561, 564–565; 1902b, 24 (of Braun, 1901g, 564; Dies., 1850a, 346 (of Duj.); 1845a, 446 (of Rud.); 1819a, 676; and of Stoss., 1892, 2; to Mesaulus), 26, figs. 16–19.—Cobbold, 1860a, 12.—Dies., 1850a, 346–347.—Duj., 1845a, 446.—Odhn., 1902, 32, 34, 35.—Stoss., 1892, 182.

grandiporum Rud., 1819a, 110–111, 407–408 (in Muræna helena; Naples).—Braun, 1893a, 873.—Cobbold, 1860a, 23.—Dies., 1850a, 342, 371–372 (includes D. varium Eysenhardt, D. dimidiatum Crep.).—Duj., 1845a, 421.—Johnston, 1901, 337.—Kroyer, 1852–53a, 778 (in Acipenser sturio).—Lint., 1898, Jan. 20, 520–521, pl. 44, fig. 9; 1901, 415, 418, 436, 486 (in Anguilla chrysypa, Pseudopleuronectes americanus); 1905, 328, 334, 351 (in Leptocephalus conger).—Looss, 1899b, 640 (to Hemiurus).—Luehe, 1901, 476–477.—Mol., 1859, 826–828, pl. 2, fig. 5 (syns. D. varium Eysenh., D. dimidiatum Crep.) (in Accipenser sturio, Greifswald; Anguilla vulgaris, Padua; Muræna helena, Naples).—Odhn., 1905, 360.—Olss., 1876, 20.—Stoss., 1886, 14; 1902, 582.

granulum Rud., 1809a, 394–395 (in Cottus scorpius) (includes Fasc. scorpii Mueller, 1776); 1819a, 106.—Cobbold, 1860a, 27.—Dies., 1850a, 366.—Duj., 1845a, 457.—Kroyer, 1838–40a, 138, 368 (in Zoarces viviparus, Cottus scorpius).—Nord., 1840, 620 (syn. of Fasc. scorpii).—Olfers, 1816, 46.—Stoss., 1886, 50.

grassum Biermer, 1863a, 395 (for crassum).

gruis (Gmelin, 1790) Zed., 1803a, 221–222.—Baird, 1853a, 55 (syn. of D. echinatum Zed.).—Dies., 1850a, 383 (syn. of D. ech. Zed.).—Rud., 1809a, 432; 1819a, 115.

gulosum Lint., 1901, 415, 418, 454, figs. 315–317 (in Rhombus triacanthus).—Nicoll, 1907, 69.

gyrini Linst., 1884, 141–142, pl. 10, figs. 27–28 (in tadpole of Rana temporaria).—Braun, 1893a, 870.—Stoss., 1889, 68.

hæmatobe Ben., 1858a, 219 (for D. hæmatobium).

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hepatis innocuum Bælz, 1883, 236, fig. 2.—Billet, 1893a, 509 (syn. of D. sinense Cobbold).—R.Bl., 1888a, 618 (syn. of D. japonicum), 621-622, figs. 323-324; 1891, 607 (syn. of D. sinense).—Braun, 1903, 3. ed., 161 (syn. of Opis. sin.).—Carœs, 1888a, 41, pl. 1 (innocuum).—Cobbold, 1884g. 976.—Grall, 1887a, 460, 468, 469, 1 fig.—Hahn & Lefèvre, 1884a, 544 (syn. of D. sin.).—Hoyle, 1890, 538.—Kamensky, 1900a, 18.—Katsurada, 1900. 479.—Looss, 1905, 90 (syn. of Opisth. sinen.); 1907, Feb. 1, 140.—Rail., 1893a, 362.—Ward, 1895, 328 (in Homo) (syn. of D. sin.); 1903, 870 (syn. of Opisth. sin.).—See Clonorchis.

hepatis perniciosum Bælz, 1883, 234.—Billet, 1893a, 509 (syn. of D. sinense Cobbold).—Carœs, 1888a, 41.—Cobbold, 1884g, 976.—Grall, 1887a, 460, 469.—*Katsurada*, 1900, 479.—Looss, 1905, 90 (syn. of Opisth. sin.).—See Clonorchis.

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hepatium Rivolta, 1884, 27, for hepaticum.

heteroclitum Mol., 1859, 289 (in Perdix coturnix; Batavii); 1861, 203.—Braun, 1893a, 874; 1902b, 116.—Dies., 1859c, 430.—Looss, 1899b, 650 (thinks this may be a Clinost.).—Mont., 1893, 155.—Stoss., 1892, 174 (to Mesogonimus).

heterolecithodes Braun, 1899a, 3 (in Porphyrio porphyrio; from Madagascar, Africa); 1899, 632; 1899, 133–135, 300 (in Gallinula chloropus, Porphyrio porphyrio); 1902b, 109.—Looss, 1899b, 635 (type of Athesmia); 1902m, 790.—Jacoby, 1899a, 133–135; 1899b, 300 (in Gallinula chloropus, Porph. porph.); 1899c, 1–30, 2 pls.; 1900, 1–11, 12, figs. 1–5.

heteromorphum Crep., 1837a, 317 (in Trigonocephalus sp. dub.); 1846a, 147 (in Trigonoc. sp. dub.).

heterophies Perroncito, 1879, 6, for heterophyes.

heterophyes Sieb., 1852, 62–64, pl. 5, figs. 16–17 (in Homo; Egypt); 1853, 455, pl. 5, figs. 16–17.—Aitken, 1866, 804, 839; 1872, 146, 205; 1874, 58.—Arschoff, 1892, 495.—Bilharz, 1856a, 50.—R. Bl., 1888a, 625, 627, fig. 325, 631; 1891s, 791; 1891p, 609, 610, 611.—de Bonis, 1876, 163; 1882, 179.—Braun, 1883a, 66; 1892, 50; 1892a, 581, 642, 707, 735, 738; 1895b, 143–144, fig. 59; 1900h, 3, 6; 1901e, 334, 336, 337; 1903, 3. ed., 164 (to Cotylogonimus).—Cobbold, 1860a, 6; 1864, 194; 1866, 6; 1876, 210, 211; 1879b, 34–35, fig. 4; 1883, 401 (hyterophytes).—Dav., 1877a, lxxvii.—Dies., 1858e, 332.—Dunglison, 1893, 338, 820, 1174.—Eichhorst, 1901, v. 1, 301.—Goubert, 1878, 101.—Günther, 1858, 207–208.—Hahn & Lefèvre, 1884a, 546.—Harley, 1864a, 62.—Hoek, 1859, 42 (or Pag. id.).—Hoyle, 1890, 538.—Huber, 1896a, 579.—Ijima, 1889b, 147.—Jacoby, 1900, 22, 23 (D. fraternum and D. heterophyes with D. lingua and D. concavum together form one group).—Jægers., 1898, 7, 8, 9, 12 (compares D. het., D. fraternum, D. lingua).—Jamieson, 1897a, 74.—Janson & Tokishige, 1892, 350.—Janson, 1893c, 265.—Kholodk., 1898, 26, 30, pl. 11, fig. 14; 1899a, 152.—Kuech., 1855, 210–212, pl. 4, figs. 11–12.—Kuech. & Zuern, 1881, 338.—Leuck., 1863a, 526, 613–616, 619, fig. 207; 1889, 399.—Looss, 1894d, anatomy, 1–42, pl. 1, figs. 1–8, pl. 2 (figs. 9–12); 43, 44, 45, 46, 47, 48, 49, 51, 52, 55; 1894a, 168; 1895a; 1896b, 60, 61, 63–64, 156, pl. 5, figs. 38–40; 1896h, 863–864; 1899b, 533, 539, 550, 556, 585 (type of Cœnogonimus), 709; 1900, 607; 1902m, 804, 805, 886.—Luehe, 1899, 538, 539 (type of Cotylogonimus).—Manson, 1901, 541 (in man in Egypt; apparently no morbid symptoms); 1903, 3. ed., 664 (to Mesogonimus).—Moniez, 1896, 86, 133, 141–144, fig. 28.—Mont., 1893, 95, 155, 157; 1896, 168.—Mosler & Peiper, 1894, 177, fig. 69.—Much., 1898, 81, 82 (compares D. het. and D. fraternum with D. concavum, which he looks upon as Mesogonimus).—Paul, 1860, 20.—Perroncito, 1879, 6 (heterophies).—Rail., 1890, 138 (to Mesogonimus).—Roberts, 1888, 673.—Sandwith, 1899, 591; 1899, Sept. 30, 888 (case).—Schneidemuehl, 1896, 302.—Simon, 1897, 209, 223–224.—Sons., 1883, v. 1, 155 (found by Sons., Egypt); 1896, 295, 299, 314.—Stiles, 1904i, 44 type of Heterophyes.—Stiles & Garrison, 1906a, 76.—Stiles & Hass., 1900a, 563 (type of Heterophyes).—Stoss., 1892, 31–32 (to Mesogonimus); 1898, 42.—Swart, 1862, 37.—Verrill, 1870, 171.—Vogt, 1878, 10, 13, 14.—Wagner, 1883, 121.—Ward, 1895, 328 (in Homo); 1903, 870.—Wood & Fitz, 1897, 335.—Also reported for Canis familiaris.

heterophyes hominis Dies., 1855, 64, for heterophyes.

heteroporum Duj., 1845a, 402–403 (in Vespertilio pipistrellus; Rennes) to (Brachycœlium).—R. Bl., 1891, 467–468.—Brand., 1888, 249, 250, pl. 17, fig. 4.—Braun, 1891d, 421; 1892a, 568, 579, 715, 766; 1893a, 911; 1893b, 185 (in Vesperugo pipistrellus); 1900, 224, 227; 1900, 388.—Cobbold, 1860a, 8; 1879b, 294.—Dies., 1850a, 382–383.—Kolenati, 1857, 12.—Linst., 1884, 139.—Looss, 1892, 66; 1896b, 86; 1899b, 547, 611, 614, 618, 718 (type of Pycnoporus); 1902m, 772.—Luehe, 1899, 536, 537.—Staff., 1903, 828.—Stiles, 1901, 197, 199, 200, 201, 202, 203.—Stoss., 1892, 12 (in Nannugo pipistrellus; Hameln, Rennes).

heterostomum Rud., 1809a, 50, 381–382 (in Ardea purpurea; t. l. apparently Europe); 1819a, 102–103, 388, 680.—Braun, 1892a, 578, 674, 721; 1893a, 872, 873, 910; 1899, 1 (Dicrocœlium); 1899g, 465, 484, 485, 486 (of Rud., 1809a, to Clinost.); 1900, 140–141; 1900h, 4, 9, 13, 14, 15, 16, 17, 18, 19 (includes the following as syns. of Clinost. heterostomum: Rud., 1809a, 1819a; Duj., 1845a; Dies., 1850a; Stoss., 1892; Par., 1896) (in Ardea cinerea, A. purpurea, Nycticorax griseus), 20, 24, 25, 26, 28, 29, 30, 31, 42, 43, pl. 1, figs. 1–2; 1901, 561.—Cobbold, 1860a, 10.—Dies., 1850a, 353 (includes Fasc. epatica of Rosa., in Ardea purpurea).—Duj., 1845a, 400.—Leuck., 1863, 503.—Looss, 1899b, 650, 651.—

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MacCallum, 1899, 697, 704, 705, 706, 707.—Mont., 1893, 95.—Olfers, 1816, 44.—Par., 1896, 2.—Stiles & Hass., 1898a, 86 (includes C. gracile Leidy, 1856, type of Clinost. Leidy).—Stoss., 1892, 64; 1892, 159; 1898, 42.—Wright, 1879, 3, pl. 1, fig. 1.—Also reported for Ardea herodias.

heterostomum from Ardea purpurea in Turin collection ("C. No. 43 resp. C. No. 361") and in collection of Par. (collected at Geneva).—Braun, 1899g, 491 (Clinost. foliiforme); 1900h, 30.

heterostomum Rud. of Linst., 1883, 306; 1886, 30, fig. 49.—Braun, 1899g, 491 (not Clinost. heterostomum but perhaps Cl. complanatum).

heterostomum Rud. of Wright, 1879, and MacCallum, 1899.—Braun, 1899g, 491 (not Clinost. heterostomum but probably Cl. marginatum); 1900h, 29, 43.

heurteli Poir., 1885, 9, 10, pl. 23, fig. 2 (in Thynnus vulgaris).—Buttel-Reepen, 1902, 167, 172, pl. 6, fig. 13.

hians Rud., 1809a, 359–360 (in Ardea nigra; Greifswald); 1814a, 101; 1819a, 94, 366, 680.—Baird, 1853a, 51 (includes D. œsophagi ardeæ nigræ Viborg).—Ben., 1858a, 1861a, 171, 202; 1868, 295, 296, 298, 299–300, pl. 1, figs. 6–7.—Braun, 1891d, 424 (in Ardea cinerea); 1892a, 584, 662, 699, 764, 768, 776, 784, 785, 786; 1893a, 873; 1893, 354; 1895b, 17; 1899g, 485, 486, 489 (from Ardea cinerea, in Pavia, and from Nycticorax griseus, in Cagliari, as syn. of Clinost. heterostomum); 1899, 465; 1900, 24, 25; 1900h, 14, 15, 17, 18, 19, 23; 1901b, 33; 1901, 896; 1901, 561; 1902b, 4.—Cobbold, 1860a, 10.—Condorelli, 1897c, in 118–124 (in Hydrocolæus minutus).—Crep., 1837, 311, 316, 324.—Dies., 1836, 248; 1850a, 337–338; 1858e, 333.—Duj., 1845a, 399.—Gamb., 1896a, 63.—Gurlt, 1845, 276.—Kuech., 1855, 192.—Leuck., 1879, 14, 15; 1886d, 11.—Looss, 1892a, 14; 1899b, 562–563 (type of Cathæmasia).—MacCallum, 1899, 706.—Mueh., 1896, 588–589; 1896, 252–257, figs. 3, 10; 1898, 28.—Mueller, 1897, 15–16, pl. 2, fig. 6.—Nathusius, 1837, 65.—Nord., 1832a, 90, 93; 1840, 617.—Olfers, 1816, 44.—Par., 1887, 331, pro parte (in Nycticorax griseus) (syn of Clinost. heterostomum teste Braun, 1900h, 19).—Sieb., 1835, 66, 73, 82.—Stoss., 1891, 111; 1892, 160 (syn. D. complanatum).—Wagener, 1857, 26.—Will.-Suhm, 1876, 337, 339.—Also reported for Ardea nycticorax, A. purpurea, Ciconia alba, C. nigra.

hippopodii Vogt, 1854, 97–98, 99, pl. 15, fig. 3 (in Hippopodius leteus; Quoy et Gaimard, Mediterranean).—Braun, 1893a, 852.—Graefe, 1860a, 13.—Mont., 1888a, 77; 1888, 195; 1893, 124.

hirndinis Brand., 1888a, 13, misprint for hirudinis.

hirsutum Looss, 1896b, 68–73, 76, 78, 81, 98, pl. 5, figs. 45–49 (in caméléon; Alexandria); 1899b, 547 to Lecithodendrium.—Luehe. 1899, 536.—Stiles, 1901, 200.

hirudinis Henle.—[Crep., 1841a, 79 (Distome in Hirudo vulgaris), does not use combination].—Dies., 1850a, 418 (syn. of Heptast. hirudinum Schomburgk).

hirundinum Zed., 1800a, 163, 169–171 (for hirundinis Frœlich) in Hirundo apus, H. urbica; Europe; 1803a, 210.—Braun, 1901, 566; 1902b, 46 (syn. of Plagiorchis maculosus).—Dies., 1850a, 349 (syn. of D. maculosum).—Rud., 1809a, 374.

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hispidum Abildg. in Rud., 1819a, 118, 423–424 (in Accipenser sturio; Arimini, Berlin); 1809a, 435 (syn. of D. sturionis for D. hispida accipenseridis sturionis).—Ben., 1870, 83.—Braun, 1892a, 567, 583, 594, 729, 737;—Carus, 1884, 126.—Cobbold, 1858b, 162, pl. 32, figs. 47–48, pl. 33, figs. 49, 50 (in Acipenser sturio); 1860a, 36.—Crep., 1829, 73–76; 1837, 311, 312, 325.—Dies., 1850a, 392–393.—Duj., 1845a, 470.—Kroyer, 1852–53a, 21, 778 (in Acipenser sturio; Osmerus eperlanus).—Leidy, 1887, 24.—Lint., 1901b, 414, 422, 478, fig. 321, 322, 323 (in Phycis tenuis); 1905, 328, 334, 364, 400, 478 (includes as hosts: Menticirrhus americanus; Seriola lalandi).—Looss, 1894a, 218; 1899b, 576, 581; 1901, 634.—Mehlis, 1831, 187–190.—Nord., 1832a, 90.—Odhn., 1902, 154.—Stoss., 1885, 156; 1886, 41; 1891, 216.—Also reported for Acipenser glaber, A. ruthenus, A. stellatus.

histrix Dies., 1850a, 393–394 for D. hystrix; 1858d, 268.—Duj., 1845a, 433.—Mol., 1858, 131; 1861, 223.—Mont., 1888, 198.

holostomum Rud., 1819a, 94–95, 368 (in Rallus aquaticus; Vien. Mus.).—Braun, 1892a, 772; 1901, 561, 565; 1902b, 136 (syn. of Urogonimus macrostomus Rud.) (includes Dies., 1850a, 339; Duj., 1845a, 446; Rud., 1819a, 94, 368; Sieb., *1848, 144; 1853,* 433; Walter, 1866, 14; Zeller, 1874, 574), 137.—Cobbold,

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1860a, 11.—Dies., 1850a, 339, includes D. ralli; 1858d, 277.—Duj., 1845a, 446.—Fil., 1855b, 25.—Moul., 1856a, 21, 183 (in Rallus aquaticus; Gallinula porzana; G. chloropus).—Par., 1896, 2.—Sieb., 1836, 234.—Stoss., 1892, 145, to Cladocœlium.—Wagener, 1857, 24, 45.—Walter, 1866, 64.

homoeostomum Dies., 1858e, 343 (D. Triglæ pini Bellingham, 1844a, 428 renamed) (t. h. Trigla (Pini) cuculus; in ventriculo, Hibernia, Bellingham).—Cobbold 1860a, 30.—Stoss., 1886, 50.

homolostomum Linst., 1887, 104–105, pl. 2, figs. 5, 6, 17a (in Limnæa stagnalis).—Braun, 1893a, 873.

horridum Leidy, 1850, 303–304, pl. 43, fig. 1 (in Boa constrictor); 1850f, 118; 1856b, 44; 1904a, 41, 87, 227.—Braun, 1893a, 876; 1893d, 467.—Cobbold, 1860a, 20.—Dies., 1858e, 355.—Looss, 1894a, 196.—Luehe, 1899, 531, 532.—Sons., 1890,—; 1893, 499; 1893, 215–216; 1893, 2 pp.; 1893, 28 Oct., 566.—Stoss., 1895, 220 (in Python molurus); 1904, 2.—Volz, 1899, 235, 237.

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hyalinum Rud., 1809a, 389 (in Salmo eriox) Fasc. eriocis renamed; 1819a, 105.—Cobbold, 1860a, 26.—Dies., 1850a, 363.—Duj., 1845a, 465.—Harz, 1881c, 5 (syn. Fasc. eriocis Mueller).—Kroyer, 1843–45a, 624 hyatinum (in Salmo eriox).—Nord., 1840, 620 (syn. of Fasc. eriocis).—Olfers, 1816, 46.—Stoss., 1886, 50.

hyans Moul., 1856a, 49, misprint for hians.—Mehlis, 1831, 190.

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hylæ Rud., 1819a, 121 (in Hyla arborea).—Dies., 1850a, 342 (syn. of D. cygnoides).

hystrix Duj., 1845a, 433 (in Pleuronectes maximus, P. platessa).—Braun, 1892a, 655; 1893a, 865, 871, 873.—Carus, 1884, 128.—Dies., 1850a, 393 (histrix); 1858e, 353 (in Merlangus carbonarius, Lepidoleprus trachyrhynchus; Lophius piscatorius; Rhombus maximus).—Fil., 1855b, 18, 19.—Gamb., 1896a, 72.—Kroyer, 1838–40a, 610, 612 (in Platessa vulgaris; Rhombus maximus).—Looss, 1899b, 581, 696 (to Stephanost.).—Mol., 1861, 223.—Moul., 1856a, 212 (Filippi believes Cerc. echinocerca is the young form), 219 (in Pleuronectes maximus; P. platessa).—Olss., 1868, 52.—Stoss., 1886, 37.

hyterophytes Cobbold, 1883, 401 (for heterophyes).

[*illotum* Sluiter, 1898 (a tunicate).]

imbutiforme Mol., 1859, 839, 844–845 (in Labrax lupus; Padua).—Carus, 1884, 127.—Looss, 1899b, 576, 578, 581, 582; 1901, 631.—Mont., 1893, 177.—Stoss., 1883, 115; 1886, 36.

imitans Mueh., 1898a, 17–18 (in Abramis brama; Kœnigsberg i. Pr.); 1898b, 25, 91, fig. 8b.—Looss, 1899b, to Asymphylodora.

imparispine Lint., 1905, 327, 334, 371, figs. 189–194, in Rachycentron canadus; N. C.

incerta Cobbold, 1885g, 177–178, 1 fig. (in Coluber; Maldonado, Rio Plata).—Braun, 1893a, 872.—Stoss., 1895. 230.—West, 1896, 322.

incistidata Erc., 1881e, 96, pl. 2, fig. 10, 11, 12; 1882a, 332 (probably incistidata simply means incysted and is not used as a specific name).

incisum Rud., 1809a, 361, 435 (D. anarrhichæ lupi Rathke, renamed); 1819a, 94, 122.—Ben., 1870, 48, pl. 4, fig. 5.—Braun, 1893a, 875.—Cobbold, 1860a, 22.—Dies., 1850a, 339.—Duj., 1845a, 461–462.—Jacoby, 1900, 12, 13.—Kroyer, 1838–40a, 380 (in Anarrhichas lupus).—Linst., 1903, 278.—Odhn., 1905, 310.—Olfers, 1816, 45.—Type of Fellodist., 1904.

incivile Leidy, 1856b, 44 (in Leiostomus obliquus); 1904a, 87.—Cobbold, 1860a, 20.—Dies., 1858e, 350 (in Leiost. obliq.; Philadelphia).—Stoss., 1886, 40; 1895, 231.—Also reported for Sciæna obliqua.

inclusum Polonio, 1859, see Par., 1894, 149 (in Triton punctatus; Padova).

incommodum (Leidy, 1856) Leidy, 1891a, 414 (includes D. oricola Leidy, 1884); 1904a, 235.—Mont., 1892, 715.

incomptum Stoss., 1886, 51, for incomtum.

incomtum Rud., 1819a, 683 (in Chætodon sp., Brazil).—Cobbold, 1860a 27.—Dies., 1850a, 367.—Duj., 1845a, 459.—Stoss., 1886, 51 (incomptum).

inconstans Lint., 1905, 327, 334, 400, fig. 183–187, in Chætodipterus faber; N. C.

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incrassatum Dies., 1850a, 390–391 (in Lutra solitaria; Brazil); 1855, 68, pl. 3, figs. 22–25; 1858e, 350 (in L. sol.).—Braun, 1901e, 317–318, 328, fig. 5, 8, 9; 1902b, 27.—Cobbold, 1879b, 298.—Mont., 1888a, 14.—Stoss., 1892, 30 (to Echinost).

increscens Olss., 1868, 36–37, pl. 4, fig. 83 (in Scomber, Merlucius, Hippoglossus).—Ben., 1870, 37.—Braun, 1892a, 699.—Lint., 1901, 415, 479.—Mont., 1893, 95.—Odhn., 1905, 332 (in Scomber), 338 (syn. of Lepodora rachisæa, type).—Stoss., 1886, 42, to (Echinost.) (in Hippoglossus maximus, Merlucius vulgaris, Scomber scombrus).—Also reported for Gadus merlangus, G. morrhua.

inerme Nitzsch, MS., in Rud., 1819a, 375 (in Anas boschas fera) (syn. of D. oxycephalum).—Dies., 1850a, 346 (syn. of D. oxyc.).

inerme Fil., 1857c, pl. 2, fig. 16, for D. inerme paludinæ impuræ.—Erc., 1881e, 35; 1882a, 271.—Harz, 1881c, 4.

inerme Linst., 1879, 183 (in Petromyzon fluviatilis).

inerme paludinæ impuræ Fil., 1857c, pl. 2, fig. 16.—Erc., 1881e, 33; 1882a, 269.

inflatum Crep., 1849, 64 (in Alauda arvensis).

inflatum Mol., 1859, 826 (in Anguilla vulgaris; Padua).—Braun, 1892a, 699.—Looss, 1899b, 576, 581, 582; 1901, 634.—Mont., 1888a, 14 (? Creplin or ? Molin); 1893, 83, 95.—Odhn., 1902, 154.—Olss., 1868, 37.—Par., 1887, 335, pl. 6, fig. 37.—Stoss., 1885, 157; 1886, 42; 1902, 582.

inflexum (Rud., 1802) Rud., 1809a, 395–396 (includes Fasc. jesis Gmelin), host Cyprinus jeses; 1819a, 106.—Cobbold, 1860a, 26.—Crep., 1837, 326.—Dies., 1850a, 365–366 (includes Bloch, 1782a, 11, pl. 2, figs. 10–11; Fasc. jesis Gmelin, 1790a, 3058; F. inflexa Rud., 1802, 82–83; D. carinatum Zed., 1803a, 217).—Duj., 1845a, 463.—Erc., 1881e, 56; 1882a, 292.—Nord., 1832a, 88.—Olfers, 1816, 46.—Stoss., 1886, 51.—Wagener, 1857, 44.—Also reported for Idus melanotus.

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instabile Duj., 1845a, 412 (in Sorex fodiens; Rennes), to (Brachylaimus).—Braun, 1901, 342.—Cobbold, 1860a, 8; 1879b, 296.—Dies., 1850a, 387.—Stoss., 1892, 16 (in Crossopus fodiens; Rennes).

intermedium Mehlis, in Crep., 1846, 138, 139 (in Colymbus cristatus, C. subcristatus).—Dies., 1850a, 397.—Stoss., 1892, 183.

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megastomum leporis Kuhn, 1829c; 1830a; 1830b.—Stiles & Hass., 1905a, 941.

megatocyle Linst., 1903, 354, for megacotyle.

megnini Poir., 1885, 4, 5, 14–15, 22, 25, 31, 32, 33, 39, 41, 45, 49, 51, 54, 64, 65, 66, 70, 76, 88, 94, 109, 112, 116, 117, 118, 120, 129, 130, 133, 144, 150, pl. 23, fig. 8, pl. 29, fig. 2, pl. 31, figs. 5–7, pl. 34 (in a fish).—Braun, 1892a, 569, 597, 603, 608, 623, 624, 625, 631, 666, 671, 673, 674, 677, 690, 712, 717, 724, 731, 733.—Buttel-Reepen, 1900a, 590; 1902, 184, 192, 202.—Darr, 1902, 683, 687, 693.—Jackson, 1888, 644.—Lander, 1904a, 7.—Looss, 1894a, 145 (megninii).—Mont., 1893 (megninii), 23, 27, 29, 30, 32, 33, 34, 36, 37, 40, 47, 48, 64, 80, 81, 93, 94, 95, 104, 113, 119, 125, 126, 127, 134, 135 (megninii), 102, 106, 107; 1896, 154 (megninii).—Wolf, 1903, 619, 621.

megninii Mont., 1893, 102, for megnini.

melis (Gœze, 1782) Zed., 1800a, 164, 194–196.—Dies., 1850a, 382 (syn. of D. trigonocephalum).—Rud., 1809a, 415 (syn. of D. trig.).

mentolatum Mueh., 1898, 19, for mentulatum.

mentulatum Rud., 1819a, 103, 388–389, 681 (in Coluber natrix, Lacerta agilis, L. maculata; Berlin, Arimini, Apr. and July).—Braun, 1891, 99; 1892a, 766, 780, 784, 785; 1901b, 15.—Cobbold, 1860a, 19.—Dies., 1850a, 355 (includes D. colubri natricis intestinale Rud., D. colubri tessellati Rud.; D. lacertæ Rud.); 1858e, 339 (in Tropidonotus natrix).—Duj., 1845a, 415, to (Brachylaimus).—Erc., 1881e, 73, 74, 75, 76, 77, 78, 79, 82, 89 (in Tropidonotus natrix); 1882a, 309, 310, 311, 312, 313, 314, 315, 318, 325.—Holstein-Beck.—Jackson, 1888, 650 (rep. system).—Kampmann, 1894b, 451, 454, 456, 457, 462, pl. 20, figs. 6–9.—Linst., 1879, 184.—Looss, 1899b (=Lepoderma).—Luehe, 1899,

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529 (of Erc., syn. of D. nematoides), 530; 1901, 487.—Mol., 1859, 831, 837–838 (in Lacerta agilis, Berlin; Podarcis merremii, Ariminii; P. muralis, Padua; Tropidonotus natrix, Berlin; T. tesselatus).—Mont., 1893, 187.—Mueh., 1898, v. 1 (1), 10, 19 (mentolatum), 29, 92–93, fig. 13.—Par., 1894, 147, to (Brachylaimus) (in Lacerta merremii; Rimini).—Schauinsland, 1882, 496.—Sons., 1893, 186.—Stoss., 1889, 61; 1895, 217–218; 1898, 33–34; 1904, 2.—Volz, 1899, 235, 236, 238.—Wedl, 1855, 401–409, pl. 2 b, fig. 9.—Reported for Lacerta muralis, L. viridis, L. vivipara, Rana temporaria.

mentulatum Rud., of Erc., according to Luehe, 1899, 529, is D. nematoides.

mergi Rud., 1819a, 121 (in Mergus albellus; C. E. V.).—Dies., 1850a, 391 (renamed D. baculus).

merlangi carbonarii Dies., 1858e, 341, renamed D. anonymum, based on Bellingham 1844a, 428.

merlangi vulgaris Dies., 1858e, 341, renamed D. anonymum, based on Bellingham, 1844a, 428.

merlangorum Dies., 1855, 64 footnote 15, based on Bellingham, 1844a.

meropis Rud., 1819a, 120 (in Merops apiaster; C. E. V.).—Braun, 1901, 568; 1902b, 51, 52, 54 (includes Par., 1896, 5, as syn. of Plagiorchis triangularis).—Dies., 1850a, 351 (renamed D. triangulare).—Duj., 1845a, 444.—Looss, 1899b, 531, 532, 725.—Par., 1896, 5–7 to (Brachylaimus), fig. 2a.—Stiles, 1901, 172.—Stoss., 1892, 186.

mesosternum Linst., 1873, 101, see mesostomum.

mesostomum (Rud., 1803) Rud., 1809a, 387–388 (in Turdus iliacus); 1819a, 104.—Braun, 1901, 561, 566–567; 1902b, 116, 117, 126–129, fig. 76 (includes Dies., 1850a, 361; Stoss., 1890, 5; 1896, 128; 1892, 7; 1898, 33).—Cobbold, 1860a, 14.—Dies., 1850a, 361 (includes D. turdi) (in Turdus iliacus; Greifswald; Pyrrhula vulgaris, Fringilla coccothraustes, C. chloris).—Linst., 1873, 101 (mesosternum).—Mueh., 1898, 16.—Olfers, 1816, 44.—Stoss., 1890, 43; 1892; 149 (D. loxiæ, 1819); 1896, 128; 1898, 33.—Wolffhuegel, 1900, 9, 45, 46.—Also reported for Coccothraustes vulgaris, Columba livia, Merula vulgaris.

metæcus Braun, 1900f, 389 (in Vespertilio lasiopteras; V. noctua; Vien. Mus.); 1901b, 31.

micracanthum Stoss., 1889, 29, pl. 14, fig. 58 (in Pagellus erythrinus; Triest); 1898, 48.—Barbagallo & Drago, 1903, 410, to (Dicrocœlium) (in Pagellus erythrinus; Catania).—Braun, 1892a, 583, 720.—Mont., 1893, 86, 95, 102.

microcephalum Baird, 1853a, 58, pl. 2, fig. 2 (in Acanthias vulgaris; Falmouth Harbor); 1853, 22; 1855, 73–74.—Ariola, 1899, 7 (syn. of D. veliporum Crep.).—Braun, 1893a, 873.—Cobbold, 1860a, 24; 1886, 52.—Dies., 1855, 64; 1858e, 335 (in Acan. vulg.).—Linst., 1903, 354 (syn. of D. veliporum).—Lopez, 1888a, 137.—Mont., 1888a (microcephalun); 1889, 132–134; 1889, 322 (=D. veliporum Crep.); 1893, 52.—Stoss., 1886, 52.

microcephalum Crep., 1837, 311; 1849, 64 (in Corvus cornix).

micrococcum Rud., 1819a, 101, 383–384 (in Glareola austriaca; Arimini, April).—Braun, 1901, 561, 564, 567; 1902b, 41, 49, 62 to Phaneropsolus, 63, 64 (thinks identical with Phaneropsolus sigmoides), 155.—Cobbold, 1860a, 13.—Dies., 1850a, 351.—Duj., 1845a, 447.—Linst., 1887, 104.—Looss, 1902m, 823.—Stoss., 1892, 150.

microcotyle Dies., 1858e, 340 (D. pleuronectis maximi Bellingham, 1844a, 428) (in Rhombus maximus; Hibernia).—Cobbold, 1860a, 25.—Stoss., 1886, 52.

micropharyngeum Luehe, 1898g, 623–624, 625 (in flamingo; Berberei); 1899, 537.—Jægers., 1898, 16; 1900, 738.—Looss, 1899b, 619.—Odhn., 1900, 12, 13, 17.

microphylla Ben., 1870, 1871a, 70, pl. 4, fig. 2 (in Osmerus eperlanus; Belgium).—Braun, 1889a, 369.—Linst., 1887.—Stoss., 1886, 52.

microporum Mont., 1889, 322, pl. 33, fig. 1 (in Plagyodus ferox; Madeira); 1891, 520 (Plag. ferox). Looss, 1899b (to Hemiurus).

microsoma Rud., 1819a, 109, 401 (in Perca marina; Naples, June).—Carus, 1884, 125. Cobbold, 1860a, 27.—Duj., 1845a, 456.—Dies., 1850a, 370 (microsomum).—Sons., 1890, 141 (in Serranus scriba).—Stoss., 1886, 52.

microsomum Dies., 1850a, 370 (for microsoma Rudolphi).

microstomum Rud., 1809a, 50, 388–389 (in Pleuronectes solea; Paris, May); 1819a, *104*.—Cobbold, 1860a, 26.—Dies., 1850a, 362.—Duj., 1845a, 467.—Kroyer,

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1843-45a, 488 (in Solea vulgaris).—Mont., 1893, 193.—Olfers, 1816, 46.—Risso, 1826, 262.—Stoss., 1886, 53.—Wagener, 1860, 187.

miescheri Zschokke, 1890, 764, 765, 767, 781-784, pl. 11, fig. 2 (in Trutta salar) to (Cladocœlium).—Braun, 1892a, 642, 699, 700, 721, 733, 735.—Jacoby, 1900, 11.—Looss, 1894a, 173, 175; 1899b, 627.—Mont., 1893, 95 (miescherii) 153.

miescherii Mont., 1893, 153, for miescheri.

migrans Duj., 1845a, 407-409 (in Sorex araneus; S. leucodon) (=Brachylaima advena renamed, hence type of Brachylaima).—Braun, 1892a, 772; 1893a, 831, 864; 1899g, 492; 1901c, 341, 342.—Cobbold, 1860a, 9; 1879b, 296.—Dies., 1850a, 389.—Erc., 1881c, 64; 1882a, 300.—Gamb., 1896a, 71.—Moul., 1856a, 167.—Stiles & Hass., 1898a, 83, 84 (syn. of Brachylaima advena Duj.).—Stoss., 1892, 19 (migras) (in Crocidura aranea at Rennes; Sorex leucodon).

migras Stoss., 1892, 19, misprint for migrans.

miliaris Brown, 1881a, 329, misprint for militare.

militare (Rud., 1803) Rud., 1809a, 421-422 (in Scolopax arquata); 1819a, 115, 418.—Bellingham, 1844a, 426.—Ben., 1858a, 1861a, 84-89, 90, 168, 180, 193, 195, 215, 218, 219, 222, pl. 9, figs. 1-11 (includes Cerc. echinata; C. fallax; C. pacifica).—Braun, 1892a, 585, 865.—Chatin, 1880a, 308 (seminal receptacle).—Cobbold, 1879b, 436 to (Echinost.).—Crep., 1837, 311, 312, 316, 317.—Dies., 1836, 240; 1850a, 384-385; 1858d, 261; 1858e, 347 (in Numenius arquatus).—Duj., 1845a, 429.—Erc., 1881c, 29, 31; 1882a, 265, 267.—Fil., 1854a, 18, 19, 21.—Gamb., 1896a, 72.—Hahn & Lefèvre, 1884a, 516.—Hemprich & Ehrenberg.—Hoyle, 1890, 540.—Kowal., 1896d, 253 (3) (in Limnocryptes gallinula; Dublany) to (Echinost.).—Leuck., 1863a, 456.—Linst., 1873, 106 (larva=Cerc. echinifera) (in Scolopax gallinula).—Mégnin, 1884, 53.—Mont., 1888a, 24.—Moul., 1856a, 190.—Nord., 1832a, 69 (in Numenius arcuatus).—Olfers, 1816, 46.—Sieb., 1835, 57; 1854, 23.—Sons., 1897, 252.—Stoss., 1892, 163 (to Echinost.).—Ward, 1895, 341 (in Canis familiaris) (perhaps D. echinatum).—Also reported for Ascolopax gallinago, A. gallinula, Paludina vivipara.

milvi (Gmelin, 1790) Zed., 1803a, 209-210.—Dies., 1850a, 385 (syn. of D. echinocephalum Rud.).—Rud., 1809a, 429 (includes D. falconis milvi Rud.); 1819a, 115 (renamed D. echinocephalum).

minima Ben., 1870, 67 (in Clupea sprattus).—Mont., 1891, 498, 514 (minimum).

minimum Mont., 1891, 498, 514 (for minima).

minutum Cobbold, 1859d, 364, pl. 63, figs. 4-5 (in Hæmatopus ostralegus); 1860a, 14 (London); 1861, 118.—Braun, 1892a, 579; 1902b, 155.—Mont., 1893, 83.—Mueller, 1897, 18, pl. 3, fig. 1.—Nicoll, 1906, 514 (in Hæm. ostr.).—Stoss., 1892, 184.

mistroides (Mont., 1896 [144 (D. constrictum Leared, 1862 [nec Mehlis, 1842] renamed)] Braun, 1899b, 715.

[*modestum* Sluiter, 1898, (a tunicate).]

moleculum Linst., 1880, 51-52 (in Rallus pygmæus); 1887, 104.—Braun, 1892a, 579, 586; 1902b, 157.—Stoss., 1892, 150.

molini Polonio, 1859, see Par., 1894, 148 (molinii) (in Rana esculenta; Padova).

molinii Par., 1894, 148 (for D. molini).

molle (Leidy, 1856), Stiles & Hass., 1894h, 162-163, fig. 2; 1895a, 737-741, pl. 3, figs. 1-3 to (Polyorchis); 1895b, 316; 1895c, 700-701; 1896d, 426.—Braun, 1902b, 23.—Mont., 1896, 165, 166 to (Polyorchis).

mollissimum Levin., 1881a, 59-61, pl. 2, fig. 4 (in Cottus scorpius; Egedesminde).—Braun, 1892a, 699, 711; 1893a, 911.—Johnstone, 1907, 185-186, fig. 16 (in Belone vulgaris; Foulney Island).—Odhn., 1905, 356, 357 (syn. of Lecithaster gibbosus (Rud.)), 359 (of Stoss., 1889; syn. of Lecithaster confusus Odhn.).—Stoss., 1886, 11 (in Cott. scorp.; Greenland); 1889, 23 (in Alausa finta; Triest).—Also reported for Alosa vulgaris.

monas Rud., 1819a, 679 (in Amphisbæna sp.; Brazil).—Cobbold, 1860a, 19 (in Siphonops annulatus; Brazil).—Dies., 1850a, 350.—Duj., 1845a, 453 to (Brachylaimus).—Par., 1896, 12-13, fig. 5 to (Brachylaimus).—Stoss., 1889, 71.

monorchis Stoss., 1890, 40-41 (2-3), pl. 15, fig. 62 (in Cantharus orbicularis; Triest).—Braun, 1892a, 579, 581, 698, 720, 721, 728, 729; 1895b, 129.—Jacoby, 1900,

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23.—Looss, 1894a, 178, 218; 1899b, 599.—Mont., 1893, 82, 86, 87, 95, 149, 151 to [(Monorchis)].—Stiles & Hass., 1898a, 91, 98 (type of Monorchis).

monticellii Lint., 1898c, 518–520, pl. 44, figs. 2–8 (in Remora remora; Woods Holl, Mass., July, Aug.); 1901, 415, 418, 449, 451, 473, 482 (in Rem. rem.; Paralichthys dentatus, Pomatomus saltatrix); 1905, 327, 328, 334, 354, 360, 363, 364, 371, 373, 374, 376, 381, 386, 388, 393, 396, 399, 405, 411, 413, figs. 154, 155, 158 (in Bairdiella chrysura, Centropristes striatus, Coryphæna equisetis, C. hippurus, Cynoscion nebulosus, Lagodon rhomboides, Leiostomus xanthurus, Menidia menidia, Menticirrhus americanus, Micropogon undulatus, Paralichthys albiguttus, P. dentatus, Pomatomus saltatrix, Prionotus tribulus, Rachycentron canadus, Scomberomorus regalis, Seriola lalandi, Synodus foetens, Trachinotus carolinus).—Johnston, 1901, 337.—Looss, 1899b (to Hemiurus).

mormyri Stoss., 1885, 160, pl. 6, fig. 26 (in Pagellus mormyrus; Triest, Feb.); 1886, 26; 1890, 41; 1898, 36.—Barbagallo & Drago, 1903, 410 to (Brachylaimus) (in Pagellus mormyrus).—Braun, 1892a, 721, 736, 737.—Lint., 1900, 290.—Looss, 1899b, 571 (judging from Stoss.'s description, this form belongs to the Creadiinæ, perhaps to Creadium).—Mont., 1893, 94.

mormyris Hausmann, 1897b, 28 (for mormyri).

motellæ Ben., 1870, 63 (in Motella mustela).

[*mucosum* v. Dr. (a tunicate).]

mühlingi Jægers., 1899a, 7 (in Larus ridibundus) (lingua of Mueh. renamed as n. sp.; apparently Koeningsberg).—Looss, 1899b, 586 (muehlingi) (pro tem. to Tocotrema).

mülleri Levin., 1881a, 56–58, pl. 2, fig. 3 (in Cottus scorpius, Gadus ovak; Egedesminde) [spelled also müllerii, muellerii].—Braun, 1892a, 643 (muelleri), 673, 720, 721, 735.—Looss, 1896b, 136; 1899b, 643 (type of Progonus).—Mont., 1888a, 34, 37 (mullerii); 1893, 43, 61 (müllerii), 82 (muelleri), 85, 86, 95, 182, 183.—Odhn., 1905, 365, 366 (mülleri to Genarches).—Stoss., 1886, 21, 58, to (Brachylaimus).

mullerii see *mülleri*.

mulli Stoss., 1883, 114–115 (in mullini; Triest, January); 1886, 39 (in Mullus barbatus; Triest); 1898, 48.—Carus, 1884, 127.

muris Erc., 1882c, 103 [pl. 3, figs. 16–21].—Hoyle, 1890, 538 (refers to Erc.'s experiments with Cerc. armata).

musculi Rud., 1819a, 119 (in Mus musculus; Cat. Vien.).—Braun, 1901e, 340 (of Dies., 1850a, Duj., 1845a) (syn. of D. recurvum Duj., 1845).—Dies., 1850a, 395.—Duj., 1845a, 441.—Stoss., 1892, 35 (in Mus musculus; Vienna).

musculorum Braun, 1893a, 871 [D. musculorum percæ Waldenburg, renamed].

musculorum percæ Waldenburg, 1860, 16 (in Perca fluviatilis).

musculorum suis Duncker, 1896a, 279–282, 8 figs.; 1897a, 197–198; (1881a, 23–25, figs. 1–6, 55, 159–160, 1 fig.; 1881d, 141; 1884a, 39–40, figs. 1–6).—Stiles, 1898a, 28. See Agamodist. suis.

musculum Brett, 1880a, 453; 1881a, 139–142 (in Ovis aries).—[=Sarcosporidia?]

mutabile Mol., 1859, 833–834 (in Podarcis muralis; Padua).—Braun, 1893a, 875; 1901, 563.—Hollack, 1902a, 869.—Klein, 1905, 20; 1905, 78.—Looss, 1902m, 818, 819, 823, 839.—Luehe, 1900, 563–566; 1901, 172, 173; 1901, 487.—Odhn., 1902, 41, 42.—Rizzo, 1902, 27 (to Anchitrema).—Sons., 1893, 185, in Podarcis muralis Wagl.—Stoss., 1895, 224.

mystacidis Linst., 1896i, 379, larva (in Mystacides nigra).

naia Duj., 1845a, 387, for naja.

naja Rud., 1819a, 99, 377–378, 589 (in Coluber natrix; Berlin) (includes Fasc. longicollis Abildg., 1788, 34, pl. 151, figs. A 1–2, from Coluber natrix renamed and D. colubri natricis pulmonale).—Braun, 1891, 99; 1892a, 766, 780, 784, 785; 1893a, 876.—Cobbold, 1860a, 18 (D. longicolle).—Crep., 1837, 326.—Dies., 1850a, 348.—Duj., 1845a, 395 to (Dicrocœlium).—Erc., 1881e, 79, 80, 81, 82; 1882a, 315, 316, 317, 318.—Giebel, 1857, 266.—Kampmann, 1894b, 454, 457.—Lamouroux, 1824a, 562.—Looss, 1899b, 603–604 (type of Macrodera); 1902, 732 (type of Saphedera).—Luehe, 1899, 533.—Mont., 1893, 187.—Mueh., 1898, 29.—Par., 1894, 147 (in Natrix torquata; Padova).—Rizzo, 1902, 28.—Schauinsland, 1882, 496.—Sons., 1893, 185 (naia, in Tropidonotus *natrix*).—Stoss., 1895, 221–222.—Volz, 1899, 234, 237.—Also reported for *Zamenis* viridiflavus.

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nanum (Rud., 1802) Rud., 1809a, 376–377; 1819a, 101.—Braun, 1893a, 874; 1901, 561, 567; 1902b, 47, 48, 49 (to Plagiorchis), 155.—Cobbold, 1860a, 12.—Dies., 1850a, 350.—Duj., 1845a, 446.—Linst., 1887, 104.—Olfers, 1816, 44.—Stoss., 1892, 184; 1892, 41; 1904, 2.

nardoi Polonio, 1859, see Par., 1894, 627 (in Lacerta muralis; Padova).

nassæ mutabilis Fil., 1855b, 22.

negacotyle Dies., 1850a, 379, for megacotyle.

neglectum Linst., 1887d, 101–102, pl. 2, fig. 3 (in Rana temporaria).—Braun, 1892a, 699, 721, 736, 737; 1893a, 881.—Kowal., 1894, 3; 1902d (9), 27 (syn. of Pleurogenes claviger Rud.).—Looss, 1894a, 82, 83, 84, 91, 92 (syn. of D. clavigerum); 1896b, 94, 95; 1899b, 617 (=clavigerum=type of Pleurogenes).—Mont., 1893, 83, 86.—Stoss., 1889, 65.

nematoides Mueh., 1898, 18 (in Tropidonotus natrix; East Prussia); 1898, 11, 29, 93–94, fig. 22.—Braun, 1899, 631; 1901b, 13, 15, 16.—Looss, 1899b, 567–568 (identical with D. ercolanii).—Luehe, 1899, 528, 529, 530.—Stoss., 1904, 5.—Volz, 1899, 236, 238.—Also reported for Lacerta agilis.

nephrocephalum Dies., 1850a, 391 (in Turdus saxatilis; M. C. V., spring and summer) (D. turdi renamed).—Stoss., 1892, 174, to Echinost.

neuronaia monroi Maddox, 1867, 97, 98, pl. 8.—Cobbold, 1872b, 92 (neuronaii monroii); 1879b, 52.

neuronaii monroii Cobbold, 1872b, 92 (for neuronaia monroi).

nigrescens Olss., 1876, 19–20, pl. 3, fig. 41 (in Lophius piscatorius).—Braun, 1892a, 587; 1893a, 872, 873.—Stoss., 1886, 53 (in Loph. pisc., Molva vulgaris).—Also reported for Hippoglossus maximus, Lota molva.

nigroflavum Rud., 1819a, 118–119, 425–427 (in Orthagoriscus mola; Naples, July) to (Echinost.).—Bellingham, 1844a, 427.—Ben., 1855c, 2, 520; 1856, 84; 1858a, 1861a, 111.—Bettend., 1897a, 17; 1897, 321.—Brand., 1898a, 209 (17).—Braun, 1892a, 578, 684, 687; 1893a, 878.—Carus, 1884, 126.—Cobbold, 1860a, 29.—Crep., 1837, 310, 311.—Deslongchamps, 1829, 238 (nigrostavum).—Dies., 1850a, 394 (includes Schisturus paradoxus); 1858e, 353 (in Orthag. mola).—Drummond, ——, 240.—Duj., 1845a, 469.—Kerbert, 1881a, 547.—Knoch, 1894a, 11, 12.—Kroyer, 1852–53a, 745 (in Orthag. mola).—Lint., 1898, 530–531, pl. 48, figs. 8–11, pl. 49, figs. 1–2; 1900, 282; 1901, 415, 422, 466 (in Mola mola); 1905, 328, 334, 374 (in Coryphæna equisetis).—Looss, 1894a, 145, 165; 1899b, 528, 631; 1902m, 721, 764, 765, 778.—Luehe, 1900, 487.—Mont., 1888a, 47; 1893, 13, 22, 23, 29, 30, 32, 40, 46, 47, 64, 65, 66, 67, 68, 80, 81, 83, 84, 93, 94, 95, 96, 102, 108, 113, 115, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 169, pl. 1, fig. 11, pl. 3, fig. 23, pl. 4, 38–42; 1891, 110; 1899, 103.—Olss., 1868, 25.—Par., 1887, 333–334.—Risso, 1826, 262.—Sons., 1890, 140–141 (in Orthag. mola); 1891, 265.—Stiles, 1901, 195, 196.—Stiles & Hass., 1898a, 92, 93 (?includes Schisturus paradoxus).—Stoss., 1886, 40.—Wagener, 1860, 174.—Ziegler, 1883, 552.

nigrostavum Deslongchamps, 1829, 238; misprint for nigroflavum.

nigrovenosum Bellingham, 1844a, 429.—Braun, 1893a, 873; 1900, 233; 1901b, 37.—Dies., 1858e, 343 (in Tropidonotus natrix; England).—Looss, 1894a, 219; 1902m, 504, 820, 821, 822, 831.—Luehe, 1899, 533, 534, 535 (thinks this is a Lecithodendrium); 1900, 561–562.—Mont., 1893, 24, 32, 33, 34, 40, 41, 42, 43, 82, 83, 84, 85, 88, 89, 91, 95, 98, 102, 105, 106, 107, 113, 116, 117, 185–189, pl. 6, figs. 88–90, pl. 8, figs. 117–120, 132; 1896, 151, 152, 154.—Mueh., 1898, 29.—Odhn., 1902, 42.—Rizzo, 1902, 28 (to Lecithodendrium).—Stoss., 1895, 222–223.—Volz, 1899, 235, 236, 237.—West, 1896, 323.

nigrovenosum natricis torquatæ Dies., 1855, 64, based on Bellingham, 1844.

nigrum Linst., 1883, 307 (in Corvus cornix); 1886, 31.—Stoss., 1892, 185.

nitens Lint., 1898c, 534–535, pl. 51, figs. 5–6, pl. 52, fig. 1 (in Tylosurus caribbæus; Woods Holl, July); 1901, 415, 422 (in Tyl. acus).—Looss, 1899b, 710.

[*nitidum* Sluiter, 1898, 17 (a tunicate).]

noctulæ Rud., 1819a, 119 (in Vespertilio noctula; C. E. V.).—Dies., 1850a, 349 (syn. of D. chilostomum Mehlis).—Kolenati, 1857, 11.

nodulosum (Frœlich, 1791) Zed., 1800a, 164, 190–192; 1803a, 219.—Baird, 1853a, 56–57.—Ben., 1858a, 1861a, 100, 171, 177, 181, 191, 203.—Braun, 1892a, 575, 584, 587, 642, 654, 699, 747, 768, 772, 780, 784, 785, 786; 1893a, 865, 879, 911; 1900, 231, 232.—Bremser, 1824, 134; 1824, pl. 10, figs. 1–3.—Crep., 1829,

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67–69; 1837, 323, 324, 326, 327, 328, 329; 1839, 289.—Dies., 1836, 248; 1850a, 380–381 (syns. Fasc. luciopercæ, F. percæ cernuæ Mueller, F. percina Schrank, F. nodulosa Frœlich, D. campanula Duj., D. luciopercæ Zed., Planaria lagena Braun); (includes Crep., 1829a, 289; Mueller, 1836, 233, 238; Sieb., 1836, 217); 1858d, 282; 1858e, 343.—Duj., 1845a, 434–435 to (Crossodera).—Erc., 1881c, 56; 1882a, 292.—Fil., 1854a, 21; 1857c, 14 to (Crossodera).—Fraip., 1880c, 416.—Gamb., 1896a, 72.—Harz, 1881c, 5.—Hausmann, 1897b, 4, 6, 8, 14, 18, 20, 22, 27, 35 (in Perca fluviatilis).—Jackson, 1888, 652 (in Acerina cernua).—Kowal., 1894, 2; 1894, 222.—Kroyer, 1838–40a, 20, 41, 54; 1846–53a, 333; 1852–53a, 1221 (in Acerina vulgaris, Barbus fluviatilis, Esox lucius, Lucioperca sandra, Perca fluviatilis).—Lint., 1892c, 69, 70.—Linst., 1873a, 1–7, pl. 1, figs. 1–11 (development); 1873b, 328–331; 1873c, 230–231; 1873d, 345–347; 1873e, 101.—Looss, 1894a, 2, 33–41, 47, 49, 50, 123, 124, 133, 136, 150, 161, 164, 181, 191, 192, 197, 199, 208, 215, 216, 264, 268, pl. 1, figs. 8–10, pl. 5, figs. 92–94 (syns. Fasc. luciopercæ, F. percæ cernuæ, F. percina, Plan. lagena) (in Acerina cernua, Aspro vulgaris, A. zingel, Esox lucius, Lucioperca sandra, Perca fluviatilis); 1902m, 452.—Mehlis, 1831, 184–185.—Much., 1898, 22.—Moul., 1856a, 19, 24, 46, 47, 99.—Nord., 1832a, 88; 1840, 617, 621 (to Fasc.).—Olfers, 1816, 46.—Olss., 1876, 23.—Rud., 1809a, 366, 410–413; 1819a, 113.—Schauinsland, 1882, 496, 497.—Sieb., 1835, 66, 69, 70, 73, 82; 1836, 217, 233, 235, 236, 237, 238, pl. 10, fig. 1; 1850, 645.—Sramek, 1901, 95, 106, 107, fig. 60 (syns. Fasc. luciopercæ Muell., F. percæ cernuæ Muell., D. luciopercæ Zed.) (in Acerina cernua, Perca fluviatilis).—Staff., 1902, 481 (to Bunodera) (in Salvelinus fontinalis).—Stiles & Hass., 1898a, 84, 85, 96 (type of Bunodera) (includes Fasciola luciopercæ Mueller).—Wagener, 1857, 26, 27, pl. 21, figs. 3–7; 1860, 165.—Wright, 1884, 429, 430.—Reported also for Abramis vimba, Acipenser rubicundus, Barbus communis, Bithynia tentaculata; Cyprinus).

nodulosum partim Dies., 1850a, 380; 1858e, 354 (in Esox lucius) (syn. of D. (Crossodera) campanula Duj.).

[*non coronata* Crep., 1837a, 326, as name of a group of distomes.]

notidobiæ Linst., 1896i, 379, a larva in Notidobia ciliaris and Sialis lutaria "aus der Gärte."

obesa Ben., 1870, 33 (Cottus scorpius).

obesum Dies., 1850a, 361–362 (in Leporinus friderici, Salminus brevidens, Xiphostoma cuvieri; Brazil); 1855, 67, pl. 3, figs. 11–13; 1858e, 341.—Braun, 1892a, 579; 1893a, 872, 875.—Cobbold, 1860a, 24; 1879b, 458.—Odhn., 1902, 152.—Stoss., 1886, 53.

oblongum (Cobbold, 1858) Braun, 1891, 99; 1892a, 579, 583, 635, 636, 674, 692; 1893a, 875, 894, 910; 1893, 354; 1900g, 250, to Campula.—Mont., 1893, 44.—Stiles, 1895l, 219–220, pl. 7, figs. 2, 3; 1895m.—Stoss., 1892, 16–17 (includes Campula oblonga, D. campula, D. campanula) (in Phocæna communis, Platanista gangeticum).

obovatum Mol., 1858, 288–289 (in Chrysophris aurata; Patavii); 1861, 201–202.—Braun, 1892a, 736, 737.—Carus, 1884, 130.—Dies., 1859c, 428.—Lint., 1900, 290.—Looss, 1899b, 571 (thinks this form, judging from the description given by Stoss., 1890, belongs to Creadiinæ possibly to Creadium).—Mont., 1893, 94.—Stoss., 1885, 159; 1886, 27; 1889, 26; 1898, 35–36; 1901, (7) 95 (to Allocreadium).

obtusum Looss, 1896b, 78–81, 83, 85, 87, 88, 89, pl. 6, figs. 53–56 (in cameleon, Alexandria, Egypt); 1899b, 547 to Lecithodendrium.—Luehe, 1899, 534; 1900, 562.—Stiles, 1901, 200.

"*orcatum* Zed." i. e. (Gœze, 1782) Luehe, 1899k, 538 (= Dist. lorum Duj.) type of Ityogonimus.—Looss, 1900, 607.

orcatum (Rud., 1802) Rud., 1809a, 387, 397–398 (Clupea harengus; Griefswald) (includes Leuwenhoek, Epist. 97, 47; Fasc. halecis Gmelin, 1790a; Fasc. orcata Rud., 1802; Dist. halecis Zed., 1803a, 222); 1819a, 107.—Braun, 1892a, 711; 1893a, 853.—Dies., 1850a, 298, 372.—Duj., 1845a, 422–423 to (Apoblema).—Kroyer, 1846–53a, 174 (in Cl. har.).—Looss, 1899b, 641 (=D. carolinæ Stoss.) type of Pronopyge.—Mont., 1891, 496, 497, 499, 500, 501, 502, 506, 512; 1891, 16 (to Apoblema).—Reported also for Clupea alosa, C. pilchardus.

orcatum Rud. of Mol., 1858, 289 (in Clupea alosa; Padua), 290; 1861, 209–210, *pl. 3, fig. 7* (in ———).—Dies., 1859c, 432 (of Mol., p. 289, in Alausa vulg.;

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Padua).—Johnstone, 1907, 177–180, fig. 13 (in Conger vulgaris; England).—Linst., 1878a, 269 (syn. of D. ventricosum Rud., in Alosa vulg.).—Mont., 1891, 497, 498, 499, 500, 501, 520.—Sons., 1891, 259 (syn. of Dist. ventricosum Rud.).—Stoss., 1886, 12 (in Ammodytes lancea, A. tobianus [see next entry sub Odhner]; Clupea harengus, Trutta salar).—Also reported for Alosa finta, ? A. sardina.

ocreatum Mol., of Olss., 1868, 48, pl. 5, figs. 96–98 (in Ammodytes lancea, A. tobianus; ———).—Braun, 1891d, 423.—Lander, 1904a, 1, syn. of Hemiurus crenatus (Rud.).—Looss, 1896b, 125; 1899b, 640, 641 (to Hemiurus).—Luehe, 1901n, 399, 400 (syn. of Hemiurus crenatus Rud.).—Mont., 1891, 501, 505.—Odhn., 1905, 352 (syn. of Brachyphallus crenatus) (fig. 98 from Ammodytes lancea, A. tobianus, syn. of Hem. communis).—Stoss., 1886, 12.

ocreatum Mol., of Lint., 1898c, 514–515, pl. 42, fig. 13 (in Pomatomus saltatrix; Woods Hole); 1900a, 269, 282 to (Apoblema), 288 (in Merluccius bilinearis, Pollachius; Woods Hole); 290, pl. 35, figs. 16–24; 1901b, 415, 418, 472, 474, 475, 478 (in Lopholatilus chamæleonticeps, Merluccius bilinearis, Pollachius virens, Urophycis chuss; Woods Hole).—See Hemiurus lintoni, Pratt.

ocreatum of Stoss., 1888.—Stoss., 1898, 30 (syn. of Apoblema stossichii Mont.) (in Alosa sardina; Triest).—Luehe, 1901n, 398 (of Mont., 1887; Stoss., 1888, 1898) in stomach of Clupea pilchardus at Triest, syn. of Hemiurus stossichii Mont., 1891).—Mont., 1887, 86; 1891, 16, 21; 1891, 514 (syn. of Apoblema stossichii).

ocreatum (miscellaneous).—Ben., 1870, 64.—Dies., 1855a, 399.—Hausmann, 1897b, 4, 6, 20, 22 (in Trutta salar; near Basel).—Linst., 1873, 99.—Mont., 1888a, 8, 56.—Jackson, 1888, 648.—Johnstone, 1901, 337.—Juel, 1889, 7.—Olfers, 1816, 46.—Pag., 1857, 4.—Pratt, 1898, 6 (in Pseudocalanus elongatus at Kiel) det. by Mœbius as ocreatum, by Mont., 1891, 13 as Apoblema append. Rud.; 1898, 354.—Wagener, 1860, 166, 183.—Will.-Suhm., ——, 142–143; 1871, 382–383.

octopodis delle Chiaje, 1841, 139.—Carus, 1884, 133.

ocular de Bonis, 1882, 180.—Stiles, 1902s, 29 (see Agamodist. ophthalmobium).

oculare Moquin-Tandon, 1860, 347.—Stiles, 1902s, 29.

oculatum Levin., 1881a, 64, 67, pl. 2, figs. 7–8 (in Cottus scorpius; Egedesminde).—Braun, 1892a, 579, 693, 728, 729.—Johnstone, 1907, 188.—Looss, 1894a, 204, 218.—Mont., 1888a, 10, 38, 49, 78; 1891, 121; 1893, 41, 70, 82, 88, 95, 96, 105, 107, 108, 109, 160.—Odhn., 1905, 328, 331 (type of Acanthopsolus).—Stoss., 1886, 38 (in Cottus scorpius; Greenland).—Also reported for Clupea harengus.

oculi humani Gescheidt, 1833, 434–435 (in Homo).—Ammon, 1833.—Assenova, 1899, 29.—R. Bl., 1888a, 542, 630–631; 1891, 610.—de Bonis, 1882, 180.—Braun, 1895b, 145; 1903, 3. ed., 151 (perhaps F. hepatica); 1906, 156.—Cobbold, 1866, 7.—Dies., 1850a, 334 (syn. of D. ophthalmobium).—Dunglison, 1893, 338, 820.—Eiss, 1838, 22–23.—Gamb., 1896a, 63.—Hackley, 1886, 519.—Ijima, 1889b, 123.—Kuech. & Zuern, 1881, 328–329, pl. 8, fig. 12.—Moniez, 1896, 86, 152–153.—Mont., 1892, 713.—Schneidemuehl, 1896, 302.—Sieb., 1839, 164.—Stiles, 1898a, 48; 1902s, 27, 29, 32, 33.—Fischer von Waldheim, 1840a, 149.—Wallenstedt, 1847, 7.—Ward, 1895, 328 (in Homo) (see D. ophthalmobium); 1903, 866 (syn. of Agamodist. ophthalmobium Dies.).—Weinland, 1859, 281 to Dicrocœlium.

œsophagi ardeæ nigræ Viborg, 1795, 242.—Baird, 1853a, 51.—Dies., 1850a, 337 (syn. of D. hians).—Rud., 1809a, 359.

okeni Ariola, 1906, 185, for okenii (Dist.).

okenii Kœlliker, 1849c, 55–58, pl. 1, fig. 7 (in Brama raji).—Ariola, 1906, 185 (okeni) (to Köllikeria).—Ben., 1858a, 1861a, 105 (syn. of D. filicolle); 1870c, 137.—Braun, 1892a, 572, 573, 574, 647, 672, 698; 1893a, 878, 894, 912; 1906, 184 (okeni).—Dies., 1850a, 359, includes Monost. filicolle; M. ? molæ); 1859c, 423. 429–430.—Gamb., 1896a, 70, fig. 35.—Goldb., 1855, 16.—Kroyer, 1838–40a, 594; 1852–53a, 745 (in Brama rayi Bl.; Orthagoriscus mola).—Looss, 1892, 81.—Mont., 1893, 137, 150.—Moul., 1856a, 25 (trouvé par Kœlliker, dans l'intestin d'un cyprin).—Sons., 1890, 143.—Tasch., 1879, 608, 613.—Wagener, 1852, 566.

okuli humani of Schneidemuehl, 1896, 302 for oculi humani.

oligoon Linst., 1887d, 103 (in Gallinula chloropus).—Braun, 1892a, 167; 1902b, 16, fig. 11 (includes D. spiculigerum Mueh.).—Mueh., 1898, 97.—Stoss., 1892, 149.

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oloris Dies., 1855, 64, based on Bellingham, 1844a, 427.

onycephalum Galli-Valerio, 1898m, 923 (for oxycephalum).

opacum Ward, 1894, v. 15, 173–182, 1 pl. (in Amia calva, Ictalurus punctatus, Perca flavescens, Cambarus propinquus; New Baltimore; Lake St. Clair; August); 1895, 15 Feb., 218–219; (1895), 633–634; 1901, 176–184.—Braun, 1900, 234.—Jægers., 1900, 736, 738, 740.—Looss, 1899b, 621.—Odhn., 1905, 317.—Stiles & Hass., 1902d, 20 (type of Microphallus).

ophthalmobium Dies., 1850a, 334 (in Homo; Dresden) [D. oculi humani Gescheidt renamed]; 1858e, 333.—Aitken, 1866, 804, 839; 1872, 146, 205; 1874, 58.—R. Bl., 1888a, 630.—de Bonis, 1876, 164; 1882, 180.—Braun, 1883a, 64–65; 1893a, 870; 1903, 3. ed., 151 (perhaps F. hepatica); 1906, 156.—Cobbold, 1860a, 6; 1864a, 191–192, fig. 41; 1866, 7; 1876, 211. "D. ophthalmobium or Monost. lentis;" 1879b, 36, fig. 5.—Dav., 1877a, lxxix, 820, 822.—Dunglison, 1893, 338, 820, 1174.—Gamb., 1896a, 63.—Goubert, 1878, 130.—Gunther, 1858, 209.—Harley, 1864a, 62.—Hœk, 1859, 42.—Hoyle, 1890, 538.—Ijima, 1889b, 123.—Jamieson, 1897a, 74.—Kholodk., 1898, 26, 32, 34, pl. 11, fig. 28; 1899a, 152.—Kuech., 1855, 181, 222–223, pl. 4, figs. 13–15.—Leuck., 1863a, 526, 610–613, 633, fig. 205; 1889, 440, fig. 191.—Linst., 1878, 3.—Moniez, 1896, 152–153.—Moquin-Tandon, 1861, 373.—Mosler & Peiper, 1894, 177.—Schneidemuehl, 1896, 302.—Stiles, 1898a, 48; 1902s, 25, 29, 34.—Verrill, 1870, 171.—Vogt, 1878, 10, 13.—Wagner, 1883, 121.—Ward, 1895, 328 (perhaps young D. lanceolatum); 1903, 866 to Agamodist.—Wood & Fitz, 1897, 335.

opisthotrias Luetz, 1895a, 181–188, pl. 2, figs. 1–4 (in Didelphys aurita); 1895b, 189–193; 1896a, 623.—Braun, 1899g, 492 (to Harmost.); 1900h, 12; 1901e, 338–339 (to Harmost.).—Looss, 1899b, 748 (to Heterlope).—Luehe, 1899, 532.—Par., 1896, 3, 5.

orbiculare Dies., 1850a, 349 (in Cebus trivirgatus; Brazil); 1855, 64, pl. 2, figs. 20–22; 1858e, 335–336.—Braun, 1901e, 311, 312, 313, fig. 14.—Cobbold, 1860a, 7; 1879b, 289.—Stoss., 1892, 36 (in Nyctipithecus trivirgatus; Brazil).

oricola Leidy, 1884a, 47 (in Alligator mississippiensis; Florida); 1891a, 414 (syn. of D. incommodum); 1904a, 180.—Braun, 1893a, 872.—Mont., 1892, 715 (oricula).—Stoss., 1895, 219 oricula (syn. of D. pseudostomum).

oricula Mont., 1892, 715, for oricola.—Stoss., 1895, 219.

ornithorhynchi Johnson, 1901a, Nov. 7, 334–338, pl. 22, figs. 1–4 (in Ornithorhynchus anatinus Shaw).

orthagorisci molæ Dies., 1855, 64; 1858e, 342 (in Orthagoriscus mola; Ireland) (renamed D. macrocotyle).

osculatum Looss, 1901c, 654–656, fig. 11 (in Motella vulgaris).

ovatum (Rud., 1803) Rud., 1809a, 50, 357–358, 420, 432; 1819a, 93, 121, 674.—Anacker, 1887c, 513.—Baillet, 1866b, 105.—Baird, 1853a, 51 (includes Hirudo fasciolaris Mueller, Fasc. ovata Rud.).—R. Bl., 1888a, 643.—Braun, 1892a, 714, 734, 736, 765; 1893a, 876, 877, 879, 893; 1893d, 467, 468; 1901, 12, 13, 14, 15, 16; 1901, 258–259; 1901, 561; 1902b, 68 (to Cephalogonimus by Sons., 1890; type of Prosthogonimus Luehe, 1899, 539; and of Prymnoprion Looss, 1899b, 628), 69, 72 (in Corvus corone) 73, 74, 75, 76, 77, 78, 79, 80, 82, 83, 85.—Caruccio, 1886, 293.—Cobbold, 1860a, 9; 1879b, 440.—Crep., 1837a, 317, 318, 322, 326, 329; 1846, 130, 131, 134–137, 139, 141–143, 146; 1851, 284.—Dav., 1877a, lxxix.—Dies., 1850a, 335–336 (includes: Igeln in Hühnereiern Hanow; Hirudo fasciolaris Mueller, Fasc. ov. Rud., D. anatis domesticæ Rud.); 1858e, 333 (in Fringilla montana, Scolopax gallinago, Ardea grus, Fulica atra).—Duj., 1845a, 394–395.—Giebel, 1857, 265.—Hahn & Lefèvre, 1884a, 516.—Hass., 1896a, 2 (to Cephalogonimus).—Hugi., 1827, 48.—Juel, 1889, 36.—Kowal., 1894, 2; 1894, 221; 1895, 350; 1895, 372–390, pl. 8, fig. 7; 1896d, (7), 257, to (Cephalogonimus) (in Corvus cornix, Gallinago scolopacina; Dublany).—Landois, 1882a, 13; 1882, 23 (in hen's egg).—Linst., 1873, 95, 96, 97, 98, 100, 101, 103.—Lint., 1887, 367–369 (in hen's egg; U. S. A.).—Looss, 1894a, 264; 1899b, 628–629 (type of Prymnoprion), 720, 721; 1900, 608.—Luehe, 1899, 539 (type of Prosthogonimus).—Mehlis, 1831, 178.—Mont., 1893, 157, 190.—Mueh., 1898, 29–30, 100.—Nord., 1840, 616.—Olfers, 1816, 44.—Sambon, 1900, 219.—Schneidemuehl, 1896, 303.—Sieb., 1835, 64, 65; 1836, 233.—Sons., 1890, 134.—Spencer, 1889, 109 (in hen's egg).—Staff., 1902, 719.—Stoss., 1892, 144 (to Cephalogonimus); 1898, 23.—Tschudi, ——, 75.—Verrill, 1870, 179.—Wedl, 1857, 241–242, pl. 1, fig. 1.—Wolffhuegel, 1900, 9, 24, *26, 32.*—Also reported for Anas boschas dom., A. clangula, A. clypeata, A.

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ferina, A. glacialis, A. marila, Anser cinereus dom., Ascolopax gallinago, Astur nisus, Aegolius brachyotus, Buteo lineatus, Ceryle rudis, Chelidon rustica, Colymbus subcristatus, Corvus americanus, C. corax, C. cornix, C. corone, C. frugilegus, C. glandarius, C. monedula, C. pica, Crax pratensis, Cygnus musicus, Falco buteo, F. nisus, F. subbuteo, Fringilla cœlebs, Fulica atra, Fuligula ferina, F. marila, Gallinula chloropus, Grus cinerea, Hirundo urbica, Lanius minor, Larus canus, Numenius arcuatus, N. arquata, Otis tarda, Parus major, Phasianus gallus, Rallus porzana, Scolopax gallinago, S. rusticola, Strix brachyotus, Turdus viscivorus, Uria grylle, Vanellus cristatus.

ovatum of Matsubara (in chickens; Yedo, Japan).—Braun, 1902b, 81–82 (=Prosthogonimus japonicus).

ovatum of Wedl, 1858, 241, pl. 1, fig. 1 (in Scolopax gallinula, Grus cinerea, Fulica atra) and of Linst., 1873, 96 (in Corvus corone).—Braun, 1902b, 72–73, 77–78 (=Prosthogonimus cuneatus).

oviforme Poir., 1886, 26–27, pl. 2, figs. 7, 8, 9 (in Nycticebus javanicus).—Braun, 1892a, 700, 721, 735, 737; 1901e, 311, 313.—Looss, 1899b, 608, 618, 714, 715 (to Phaneropsolus).—Luehe, 1899, 536 (thinks it is a Lecithodendrium).—Mont., 1888a, 38; 1893, 43, 83, 95, 102, 106, 107.—Stoss., 1892, 12–13 (in Nyct. jav.).

ovocaudatum Vulpian, 1859, v. 5, 150–152 (in Rana viridis).—Brand., 1898a, 215 (23).—Braun, 1892a, 603, 765, 774, 775, 784, 786, 787, 798, 803, 805, 808, 810, 814, 815; 1893a, 857, 865, 872, 881; 1893b, 181; 1895b, 11.—Creutzburg, 1890a, 32 pp. (anat. development).—Darr, 1902, 654, 657.—Gamb., 1896a, 72.—Heckert, 1887a, 460.—Kampmann, 1894b, 446.—Leuck., 1863, 490.—Looss, 1885b, 24; 1892a, 74, 101, 123; 1894a, 2, 109–111, 120, 133, 136, 137, 154, 168, 170, 173, 179, 184, 197, 199, 200, 201, 207, 210, 211, 212, 214, 275, pl. 3, fig. 49, pl. 6, fig. 123; 1893b, 813; 1896b, 215, 226, 227; 1899b, 645 (type of Halipegus).—Luehe, 1900, 558.—Mont., 1888, 68, 72.—Mueh., 1898, 29.—Schuberg, 1894, 169.—Sons., 1892, 95; 1893, May 7, 215–217; 1893, 187, 188 (in Rana esculenta, R. temporaria); 1893, 28 Oct., 566; 1893, Apr. 30, 63–64; 1894, 2 May, 172 (Distomomum).—Stoss., 1889, 71.

ovocaudatum of Nickerson, 1898, 261–264.—Staff., 1900, 405, 409–410; 1905, Apr. 11, 687–688 (syn. of Halipegus occidualis).

ovofarctum Odhn., 1902, 153–154 (in gallbladder of Synodontis sp.; Omdurman, Apr.); 1902, 42.

ovum Crep., 1846, 159 (in Planorbis marginatus).

oxycephalikum Schneidemuehl, 1896, 303, for oxycephalum.

oxycephalum Rud., 1819a, 98, 375–376 (in Anas boschas, A. clypeata).—Anacker, 1887c, 513.—Baird, 1853a, 56 (var. of echinatum in Gallus dom.).—Baillet, 1866b, 105.—Bellingham, 1844a, 423.—Braun, 1892a, 595; 1893a, 879.—Cobbold, 1860a, 12; 1879b, 440.—Crep., 1837, 311, 312; 1846, 142, 144, 145.—Dies., 1850a, 345–346 (syns. Fasc. appendiculata boschadis, D. inerme); 1858e, 335 (in Anas clyp.; A. crecca).—Duj., 1845a, 448.—Galli-Valerio, 1898m, 923 (onycephalum) (syn. of Echinost. conoideum).—Giebel, 1857, 265.—Hahn & Lefèvre, 1884a, 516 (syn. Fasc. appendiculata Frœh.).—Hass., 1896a, 2, 3 (syn. of Echinost. echinatum).—Landois, 1882, 23.—Linst., 1873, 105.—Leuck., 1863a, 471.—Looss, 1885b, 18.—Mont., 1888, 40.—Nord., 1832a, 47.—Schneidemuehl, 1896, 303 (oxycephalikum).—Stoss., 1892, 167 (syn. of Echinost. ech.); 1899, 13.—Verrill, 1870, 179.—Reported for Anas boschas; A. boschas dom.; A. boschas fera; A. clypeata; A. crecca; A. ferina; A. marila; A. querquedula; A. tadorna; Anser albifrons; A. cinereus; Fuligula ferina; Mergus merganser).

oxyurum Crep., 1825, 48–49 (in Anas marila; Feb.); 1837a, 316; 1846, 141, 142, 143.—Braun, 1891, 100; 1892a, 570; 1901, 944; 1902b, 11, 15, 23, 26.—Cobbold, 1860a, 12.—Dies., 1850a, 345 (A. marila at Greifswald, A. clangula, A. fuligula, A. glacialis, A. nigra, A. tadorna).—Duj., 1845a, 450.—Linst., 1882, 19.—Poir., 1885, 101 (oxyurus).—Sieb., 1836, 239.—Stoss., 1892, 185.—Reported also for Bucephala clangula; Fuligula cristata; F. marila; Harelda glacialis).

pachisomum Par., 1894, 155 (for pachysomum).

pachyderma Braun, 1899e, 629 (in Chelone atra =? Thalassochelys caretta); 1901b, 26–27, fig. 23.

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pachysoma Eysenhardt, 1829, 144 (in Mugil auratus).—Braun, 1892a, 578, 614, 672, 698, 727, 737; 1893a, 910; 1895b, 129.—Cobbold, 1860a, 27.—Dies., 1850a, 366 (in Mug. aur.).—Looss, 1894a, 178; 1902, 129.—Luehe, 1900, 487.—Mont., 1888a, 12; 1893, 43, 82, 129, 151 to [(Monorchis)].—Par., 1894, 155 (pachisomum).—Sons., 1891, 253, 255.—Stiles & Hass., 1898a, 91.—Stoss., 1886, 15, 47–48 (in Mugil); 1886, 16 (in Mugil auratus, M. cephalus); 1898, 27 to (Podocotyle).—Also reported for Mugil chelo, Mergil auratus.

pacifica Steenstrup, 1842, 74–75, 135, pl. 2, figs. 2–8 (of Cerc. echinata Sieb.).—Braun, 1881a, 329.—Dies., 1850a, 297 (syn. of Cerc. fallax); 1855a, 390–391 (syn. of Cerc. (Hormost.) echinata) (includes Sieb., 1843, 6, 54–57).—Erc., 1881e, 46, 47, pl. 2, fig. 7; 1882a, 282, 283 (in Paludina vivipara).—Fil., 1854a, 17, 18.—Moul., 1856a, 187, 189, 201, 215, 230.

pagelli Ben., 1870, 1871a, 43, pl. 4, fig. 17 (in Pagellus centrodontus at Louvain, Belgium; Cantharus brama, Belgium).—Jacoby, 1900, 16.—Stoss., 1886, 20 (in Cantharus brama, Pagellus centrodontus).

palæmonis Linst., 1877b, 186 (in Palæmon serratus); 1878a, 315.

paliatum Braun, 1892a, 608 (misprint for palliatum).—Gronkowski, 1902a, 523, 531 (16, 24) (for palliatum).

pallasii Poir., 1885, 13–14, pl. 23, fig. 6 (in Delphinus phocæna).—Braun, 1892a, 569; 1893a, 873.—Buttel-Reepen, 1902, 167, 171, 172, 176, pl. 6, fig. 16.—Darr, 1902, 666, 671, 698.—Linst., 1886, 125.—Stoss., 1892, 27 (in Phocæna communis; India).

palleniscum Shipley & Hornell, 1905, 53–54, 55, fig. 11 (in Balistes sp.; Ceylon).

pallens Rud., 1819a, 111, 408, 676 (in Sparus aurata; Naples; August).—Carus, 1884, 130.—Cobbold, 1860a, 26.—Dies., 1850a, 337, 348.—Duj., 1845a, 457–458.—Lint., 1898, 526–527, pl. 47, figs. 8–9; 1901, 415 (in Alutera schœpfii), 420, 464.—Looss, 1902m, 762.—Stoss., 1886, 31; 1887, 93; 1898, 47.

palliatum Looss, 1885a, 390–427, pl. 23, figs. 1–5, 7–14, 30; 1885b, 3–40, 46, pl. 23, figs. 1–5, 7–14, 30 (in gall ducts of Delphinus delphis); 1894a, 234; 1899b, 556, 558 (type of Brachycladium), 560; 1902m, 711, 776, 777.—Bettend., 1897a, 15; 1897, 319.—Biehringer, 1888a, 230, 231, 232, 233, 234.—Braun, 1892a, 569, 591, 593, 594, 597, 602, 607, 608 (paliatum), 618, 629, 640, 641, 662, 666, 671, 673, 674, 675, 677, 682, 688, 699, 701, 704, 711, 712, 713, 717, 719, 726, 727; 1893a, 875, 910; 1893a, 354; 1900g, 250, 251, 252, 253.—Buttel-Reepen, 1902, 185, 202.—Gronkowski, 1902a, 523, 531 (16, 24) (paliatum).—Jackson, 1888, 644.—Juel, 1889, 36, 37.—Kath., 1894a, 142.—Kowal., 1898h, 124 (21).—Lander, 1904a, 16.—Linst., 1886, 125; 1890f, 174, 183.—Mont., 1888a, 26, 36, 52, 54, 58; 1893, 27, 33, 41, 42, 65, 66, 67, 75, 83, 84, 85, 88, 90, 91, 95, 99, 102, 106, 107, 108.—Poir., 1886, 37.—Schuberg, 1895, 178.—Stiles, 1895l, 219, pl. 7, fig. 1; 1901, 203, 204.—Stoss., 1892, 10–11 (to Cladocœlium).—Volz, 1899, 232.—Wolf, 1903, 615, 618.

palmatum Rentsch, 1860, 38 (in Secstichling, Gasterosteus), 41.

paludinæ impuræ Fil., 1854, 279, pl. 2, figs. 28–31 (in Paludina impura); 1854a, 24–25, pl. 2, figs. 28–31; 1855b, 23; 1857c, 9.—Dies., 1855a, 399 (to Cercariæum).—Erc., 1881e, 33, 46; 1882a, 269, 282.—Leuck., 1863a, 500.—Looss, 1894a, 32, 362 (see perlatum).—Moul., 1856a, 96 (to Cercaria).

paludinæ impuræ Baer, v. 13, 2, 655.—Dies., 1855a, 399 (to Cercariæum (tentaculorum)).

paludinæ impuræ armatum Fil., 1857c, 207–211, pl. 2, figs. 14–16; 1857c, 9–13.—Dies., 1858d, 281 (to Cercariæum).—Looss, 1894a, 32.

paludinæ impuræ inerme Fil., 1857c, 207–211, pl. 2, figs. 16–18; 1857c, 9–13.—Dies., 1858d, 280 (to Cercariæum).—Erc., 1881e, 33, 34; 1882a, 269, 270.—Looss, 1894a, 32.—Sons., 1884, 58; 1897, 252.

[*pancrii* D. Valle (a tunicate).]

pancreaticum Rail., 1890, 143; 1893a, 360 (in sheep; Japan); 1897, 371–377, 1 fig.—Gomy, 1897a, 371, 372.—Jacoby, 1900, 10, 11.—Janson, 1893c, 261.—Looss, 1907, Feb. 1, 124–127, of Janson, (from Hong-Kong).—Stiles, 1898a, 57.—Ward, 1895, 332 (in Bos taurus).

pancreaticum Katsurada & Saito, 1906, 501–506 (in cattle; Japan).—See Eurytrema.

pancreatinum Ward, 1895, 335 (in Ovis aries) "probably error for D. lanceolatum."

papillatum Rud., 1814a, 105, Fasc. appendiculata Frœlich, p. 56, pl. 2, figs. 8–9 (in Anas boschas fer.; Germany), renamed.

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papilliferum Mol., 1859, 290 (in Belone acus; Batavii); 1861, 213.—Braun, 1892a, 567, 576; 1900, 231.—Carus, 1884, 128.—Dies., 1859c, 433.—Stoss., 1886, 19.

[*papillosa* Crep., 1837a, 326, as name of a group of distomes.]

papillosum Dies., 1850a, 381 (in Beroë rufescens; Triest) (= D. beroës Will, 1844, 343, pl. 10, figs. 10–13, renamed).—Mont., 1888, 198, 199; 1893, 123.

paronæ Mont., 1893i, 43, 191, pl. 1, fig. — (in Seriola dumerilii).—Par., 1896 (in Lichia amia).

[*parva* Sluiter, 1900, 6, a tunicate.]

patellare Sturges, 1897, Sept., 57–69, figs. 1–5 (in Triturus (Molge) pyrrhogaster Boie).—Braun, 1899b, 721; 1899g, 492 (to Phyllodist.); 1901b, 9, 10, 12.—Looss, 1899b (to Spathidium).—Odhn., 1902, 64, 65.

pectinatum Lint., 1905, 327, 334, 366, 389, figs. 200–203 (in Trachinotus carolinus, Bairdiella chrysura; Beaufort, N. C.).

pedicellatum Stoss., 1887, 184–185, pl. 12, fig. 52 (in Chrysophrys aurata; Triest) (according to Stoss., 1898, this form belongs in Podocotyle).—Braun, 1892a, 578, 720; 1893a, 874, 910.—Looss, 1899b, 571 (thinks it belongs to the Creadiinæ possibly to Creadium).—Luehe, 1900u, 487 (pedicillatum).—Mont., 1888a, 12; 1893, 86, 94, 105, 107.

pedicillatum Luehe, 1900u, 487 (for pedicellatum).

pedocotyle Leidy, 1890, 282 (in Mola rotunda; Beach Haven, N. J.).; 1904a, 231.—Mont., 1893, 135.

pelagiæ Kœlliker, 1849, 53–55, pl. 2, figs. 5–6 (in Pelagia noctiluca; Naples) to (Accacœlium).—Ben., 1858a, 1861a, 178.—Braun, 1892a, 673, 682; 1893a, 852.—Buttel-Reepen, 1902, 202.—Crep., 1849a, 78.—Dies., 1850a, 395.—Mont., 1888, 198, 199; 1893, 29, 30, 40, 47, 64, 122, 123, 124, 126, 135, 136.—Moul., 1856a, 217 (in Argonauta argo; Pel. noct.).—Pag., 1862, 298 (in Arg. argo).

pelagicum Staff., 1900, 399–401, fig. 1 (free form) at Passamaquoddy Bay, St. Andrews, New Brunswick; 1902, 481, to Hemiurus (Apoblema).

pellucidum Linst., 1873, 95–103, pl. 5, figs. 5–6 (in Gallus domesticus).—Anacker, 1887c, 513.—Braun, 1892a, 678, 711, 725, 728, 734, 736; 1893a, 873, 893; 1901, 13; 1902b, 68, 72, 79 (Prosthogonimus).—Hass., 1896a, 2 (to Cephalogonimus).—Juel, 1889, 39.—Landois, 1882, 23.—Looss, 1899b, 539 (=Prosthogonimus), 628 (to Prymnoprion), 721.—Luehe, 1899, 539.—Mont., 1893, 157.—Neumann, 1892, 374 (to Mesogonimus).—Rail., 1890, 138 (to Cephalogonimus); 1893a, 369.—Schneidemuehl, 1896, 303.—Staff., 1902, 719.—Stoss., 1892, 157.

pelophylacis esculenti Wedl, 1849, 197.—Braun, 1893a, 870.—Dies., 1858e, 355 (in Pelophylax esculentus).—Stoss., 1889, 71 (in Rana esculenta).

peregrinum Braun, 1900f, 389 (in Rhinolophus ferrum-equinum); 1900b, type of Mesotretes.

pericardium Crep., 1849a, 78, D. helicis Leidy, renamed.—Dies., 1858d, 278 (syn. of Cercariæum vagans).—Leidy, 1857, 44 (=D. vagans).

perlatum Nord., 1832, 88–98, 101, pl. 9, figs. 1–9 (in Cyprinus tinca); 1840, 617, 620 (syn. of Fasc. eriocis).—Ben., 1858a, 1861a, 193.—Braun, 1892a, 747, 768, 780, 784; 1893a, 856; 1893b, 183.—Cobbold, 1860a, 29.—Crep., 1837, 311, 313, 314, 316, 317, 318, 321, 322, 323, 324, 328, 329.—Dies., 1850a, 394–395 (includes Fasc. tincæ; D. globiporum tincæ); 1858d, 280 (larva=Cercariæum paludinæ impuræ inermę).—Duj., 1845a, 401 to (Podocotyle).—Erc., 1881c, 72; 1882a, 308.—Fil., 1857c, 12, 13.—Harz, 1881c, 5.—Hausmann, 1896a, 390, 391; 1897b, 4, 6, 18, 20, 22, 29, 30, 31, 32, 33 (in Tinca vulgaris; Barbus fluviatilis).—Klein, 1905, 15; 1905, 73.—Kowal., 1894, 2; 1894, 222.—Kroyer 1846–53a, 367 (in Tinca vulgaris).—Linst., 1873, 1 (larva=Cercariæum paludinæ impuræ inermę).—Looss, 1893b, 815; 1894a, 2, 24–33, 42, 48, 86, 113, 122, 123, 124, 125, 126, 127, 135, 136, 137, 140, 148, 150, 157, 158, 166, 167, 173, 177, 178, 191, 192, 195, 207, 208, 211, 212, 213, 215, 218, 231, 232, 239, 249, 257, 262, 264, 266, 269, 270, 273, 274, 276, pl. 1, figs. 4–7, pl. 4, figs. 81–91, pl. 6, fig. 122, pl. 9, fig. 190 (in Abramis brama; Tinca vulgaris) (includes Fasc. tincæ, 1790; D. ferruginosum, 1877); 1896, 83; 1899b, 598 (type of Asymphylodora); 1902m, 770, 771.—Luehe, 1900, 487.—Moul., 1856a, 50.—Mueh., 1898, 25, 91, fig. 8a.—Odhn., 1905, 322.—Sieb., 1835, 65, 66, 82.—Sons., 1897, 252.—Stiles & Hass., 1898a, 92, 93.—Stoss., 1886, 41; 1886, 62 to (Echinost.).—Wagener, 1857, 44.

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perlatum var. *exspinosum* Hausmann, 1896a, 390–391 (in Barbus fluviatilis; Switzerland); 1897b, 29–34.

permixtus (Braun, 1901) Stoss., 1904, 2.

perniciosum Taylor, 1884, 53.—Caræs, 1888a, 35ff.—Corlette, 1897a, 146.—Dunglison, 1893, 338.—Jamieson, 1897b, 147 (syn. of D. sinense).—Laspeyres, 1904a, 12.—Lockwood, 1901, 2. ed., 821.—Tyson, 1903, 3. ed., 1180 (syn. of D. sinense).—See Clonorchis.

personatum Poir., 1885, 11–12, pl. 23, fig. 5, pl. 26, fig. 4, host unknown, Gulf of Mexico.—Buttel-Reepen, 1902, 167, 172, pl. 1, fig. 15.—Darr, 1902, 666, 671.—Lœnnberg, 1891, 71.

petalosum Lander in Looss, 1902m, 454 (probably identical with "D. auriculatum Wedl of Linton, 1897, 521," from Acipenser rubicundus and probably belongs to Bunodera).—See also lintoni.

phasiani galli Dies., 1855, 64 (D. dimorphum Wagener).—Braun, 1892a, 735; 1893a, 874.

philocholum Crep., 1845, 330 (in Delphinus phocæna, liver).

philodryadum West, 1896, 28 Feb., 322–324, pl. 11 (in Philodryas schottii; England).—Johnston, 1901, 337.—Luehe, 1900ee, 743.

philomelæ Rud., 1819a, 120 (in Motacilla philomela; C. E. V.).—Dies., 1850a, 361 (syn. of D. macrostomum).—Duj., 1845a, 443.—Stoss., 1892, 183 (syn. of D. macrost.); 1898, 23.

phoxini Linst., 1896i, 378–379, fig. 9, a larva in Phoxinus lævis.

phryganeæ Linst., 1877b, 185 (in Phryganea grandis); 1878a, 296 (in Ph. gr.); 1887, 100.

physæ fontinalis Dies., 1855a, 400 (to Cercariæum) based on Baer, 1827, 656 (in Physa fontinalis).

physophoræ Kœlliker, 1849c, 53, based on Fil., 1843, 66, pl. 5, fig. 11 (in Physophora tetrasticha; Naples).—Dies., 1850a, 374 (syn. of D. geniculatum).—Mont., 1893, 124.

pictum Crep., 1837, 313, 316 (in Ciconia alba); 1846, 135.—Ben., 1868, 298.—Braun, 1893a, 874; 1901, 260; 1901, 896; 1902b, 86, 87 88, fig. 49 (includes D. singulare Mol., 1858; Stomylus Looss, 1899b, 629; Stomylotrema Looss, 1900, 602) (to Stomylotrema).—Dies., 1850a, 397.—Stoss., 1892, 185.

pinnarum Wagener, 1857, 26 (in Gasterosteus).

pinnatum Will.-Suhm. (1873), 341.—Thomas, 1882, 447.

piriforme Crep., 1846, 142 (in Anas fusca, A. glacialis), (see D. pyriforme Crep., 1837).—Braun, 1901, 259–260.

pittacium Braun, 1901, 947–948 (in Strepsilas interpres); 1902b, 146–147.—Nicoll, 1906, 521, 522.

planicolle Rud., 1819a, 682, 686–687 (in Pelecanus sula; Brazil) to (Echinost.).—Brand., 1892, 506 to (Echinost.).—Braun, 1901, 561, 567–568; 1902b, 28, 29, 30, 31 (to Anoictost.) (includes Brand., 1892, 506; Duj., 1845a, 430).—Dies., 1850a, 326 (syn. of Monost. echinostomum).—Duj., 1845a, 430–431.—Mont., 1892, 710.

planorbis carinati Fil., 1857c, 13–14, pl. 2, figs. 12–13; 1857 or 1859, 211–212, pl. 2, figs. 12–13.—Dies., 1858d, 282 (to Cercariæum).—Linst., 1873, 7; 1877, 14.—Looss, 1894a, 41.

planorbis corni Linst., 1877, 187.

platessæ (Mueller, 1784) Zed., 1803a, 216.—Dies., 1850a, 352 (syn. of D. areolatum).—Rud., 1809a, 402 (syn. of D. areolatum).

platyurum Mueh., 1896, 267–270, figs. 6, 13–14 (in Harelda glacialis) [D. laticolle Rud. of Mueh.; East Prussia]; 1897, v. 243–279, pl. 4; 1897, 127–128; 1897, 478–479; 1898, 16, 25, 96, 97, 98.—Braun, 1901b, 33; 1902b, 11, 15, 18.—Looss, 1899b, 573–574 (type of Psilost.).

pleroticum Braun, 1899c, 631 (in host?; Brazil); 1901b, 13, 17.—Luehe, 1899, 529.

plesiostomum Linst., 1883, 305–306, pl. 10, fig. 48 (in Perdix græca; Turkestan); 1886, 29.—Braun, 1892a, 578, 700, 711, 734; 1899b, 714; 1901, 946; 1902b, 109, 112, 119.—Jacoby, 1900, 10, 11.—Looss, 1899b, 634 (to Dicrocœlium).—Stoss., 1892, 152.

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pleuronectis maximi Dies., 1855, 64 based on Bellingham, 1844a; 1858e, 340 (see Bellingham, 428), renamed D. microcotyle.

[*plumbeum* D. Valle, (a tunicate).]

poirieri Stoss., 1895, 227 (D. gelatinosum of Poir., 1885); 1904, 3.—Braun, 1899e, 631 (in Emys europæa); 1899b, 716; 1901b, 13, 15, 16, 17, 19, 30.—Looss, 1899b, 567.—Luehe, 1899, 528, 529.

polonii Mol., 1859, 291 (in Caranx trachurus; Batavii); 1861, 219.—Braun, 1892a, 576.—Carus, 1884, 126.—Dies., 1859c, 435.—Mont., 1893, 191.—Olss., 1868, 29; 1876, 15.—Sons., 1890, 142 (in Caranx trachurus L.).—Stoss., 1886, 38; 1899, 16.

polyclinorum Pag., 1862, 306, pl. 29, fig. 4 (in Polyclinum; Golf von Spézia).

polymorphum Fil., 1837a, 337–338, figs. 8–14 (in Planorbis submarginata); 1855b, 23.—Dies., 1850a, 296 (renamed Cercaria brachyura).—Moul., 1856a, 213 (syn. of Cercaria brachyura).

polymorphum (Rud., 1802) Rud., 1809a, 363–364 (in Muræna anguilla), includes Fasc. anguillæ 1790; 1814a, 101; 1819a, 95, 369–370.—Braun, 1891d, 421; 1892a, 642, 736, 765.—Carus, 1884, 132.—Cobbold, 1860a, 23 (in Anguilla vulgaris); 1879b, 458 (in Esox lucius).—Dies., 1850a, 340 (includes D. anguillulæ Abildg. ?, D. anguillulæ Zed., Fasc. anguillæ); 1858e, 333 (in Anguilla vulgaris) (includes Dies., 1850a, 340; Wedl, 1855, 383, 394, pl. 2a, 17, 400, 408, pl. 1b, 7; Stein, pl. 7, fig. 23).—Duj., 1845a, 468.—Juel, 1889, 39.—Kroyer, 1846–53a, 641 (in Anguilla migratoria).—Leeuwenhoek, ——, 344.—Linst., 1873e, 99.—Nord., 1840, 618 (syn. of Fasc. anguillæ).—Olfers, 1816, 45.—Risso, 1826, 262.—Stoss., 1902, 562.—Wedl, 1855, 383–384, pl. 2a, fig. 17; 400, pl. 1b, fig. 7.

polyoon Linst., 1887, 103–104 (in Gallinula chloropus).—Braun, 1902b, 155–156, fig. 98.—Dies., 1850a, 340.—Stoss., 1892, 186.

polyorchis Stoss., 1889, 24–25, fig. 61 (in Corvina nigra; Triest).—Braun, 1892a, 583, 673, 698, 700, 728; 1895b, 129; 1902b, 22.—Buttel-Reepen, 1902, 202.—Lint., 1901, 415, 417, 460, figs. 363, 364, 365 (in Cynoscion regalis); 1905, 328, 334, 366 (in Cyn. reg.), 385.—Looss, 1894a, 178.—Mont., 1893, 82, 84, 85, 86, 95, 148, 149; 1896, 166, to (P.).—Ofenheim, 1900, 160.—Sons., 1890, 136.—Stiles & Hass., 1895a, 737–742; 1895h, 162–163; 1898a, 92, 97 (type of Pleorchis).

pontaliei Stoss., 1892, 178, for pontalliei (Dist.).

pontalliei Cobbold, 1860a, 10 (in Ardea minuta) (D. cladocalium Dies., renamed).—Stoss., 1892, 178 (pontaliei) (syn. of D. cladocalium).

porrectum Braun, 1899b, 714 (in Saurophaga saurophaga; New Guinea); 1902b, 109.—Jacoby, 1900, 10, 11.—Looss, 1899b, 634.

pristiophori Johnston, 1902, 326–330, pl. 13, figs. 1–7 (in Pristiophorus cirratus Lath.).—Linst., 1903, 354.

pristis Deslongchamps, in Lamouroux, 1824, 563 (in Marsouin); 1824, 281.—Braun, 1892a, 579, 583, 584, 728.—Cobbold, 1860a, 36 (to Echinost.).—Dies., 1850a, 390 (in Merlangus communis; Normandy).—Duj., 1845a, 433.—Kroyer, 1838–40a, 606 (in Merlangus vulgaris Cuv.).—Lamouroux, 1824a, 563.—Looss, 1894a, 204, 218; 1899b, 581 (to Stephanost.).—Mont., 1888a, 14; 1893, 86, 88, 105, 107, 108, 109.—Stoss., 1886, 36, 45–46, pl. 8, fig. 33.—Vaullegeard, 1901, 143–146, 1 fig.; 1901, v. 8, 640.

pseudoechinatum Olss., 1876, 21–22, pl. 4, figs. 45–49 (in Larus marinus; Scandinavia).—Braun, 1893a, 874.—Kowal., 1896d, 253 (3) (in Dominicanus marinus), to (Echinost.).—Mont., 1888a, 14; 1893, 86.—Stoss., 1892, 166 (to Echinost.).

pseudostoma Will.-Suhm, 1870, 11–12, pl. 11, fig. 2 (in Alligator lucius); 1871, 185–186, pl. 11, fig. 2.—Brand., 1888a, 15.—Mont., 1892, 34; 1892, 715.—Pavesi, 1881, 294.—Poir., 1886, 334 (to Diplost.).—Stoss., 1895, 219 (in Alligator mississipiensis; Florida).

pudens Lint., 1900a, 269, 283, 290–291, pl. 37, figs. 40–47 (in Paralichthys dentatus; Woods Hole, Sept.); 1901, 415, 420, 482; 1905, 328, 334, 372, 413 (in Paralichthys albiguttus, Rachycentron canadus).

pulchellum Rud., 1819a, 94, 367–368, 595 (in Labrus cynædus; Naples).—Barbagallo & Drago, 1903, 410 (in Gobius jozo; Catania), to (Dicrocœlium).—Carus, 1884, 131.—Cobbold, 1860a, 22.—Dies., 1850a, 338–339.—Duj., 1845a,

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462.—Looss, 1901, 399.—Mol., 1859, 844.—Odhn., 1901, 484, 493, 494; 1902, 160–161 (to Helicometra).—Sons., 1891, 257–258 (in Tinca vulgaris).—Stoss., 1886, 54; 1898, 45–46.—Also reported for Blennius ocellaris, Labrus mixtus.

pulcherrimum (Weyenbergh, 1876) Weyenbergh, 1878, v. 3, 31–38 (in Hypostomus plecostomus; Argentina); 1878, 354–361; 1878, 554–561; 1880, 31–39.—Braun, 1893a, 871.—Looss, 1885b, 55.

pulicis Linst., 1892, 333–334, pl. 15, fig. 19 (in Gammarus pulex).—Braun, 1891b, 182.

pulmonale Bælz, 1883a, 236–237, fig. 3 (in Homo).—Anders, 1903, 6 ed., 1245.—Bl., 1888a, 627 (syn. D. ringeri).—Brand., 1888a, 50; 1890a, 577; 1891b, 265.—Braun, 1892a, 664, 758; 1893a, 876, 882; 1893b, 185, 186; 1901, 332; 1903, 3 ed., 155 (syn. of Paragonimus westermani).—Cobbold, 1884g, 976.—de Does, 1903, 409–412.—French, 1896a, 644.—Gamb., 1896, 63, 70.—Hahn & Lefèvre, 1884a, 546 (syn. of D. ringeri Cobb.).—Huber, 1896a, 576–577.—Janson, 1897a, 454–455 (in dogs, cats, swine).—Janson & Tokishige, 1892, 349, 351.—Katsurada, 1899a, 8–29; 1900, 506.—Katsurada & Fijiki, 1899a, 1–18, 8–29 (pathology).—Katsurada & Saki, 1899a, 141–185 (treatment).—Kholodk., 1898, 26, 31, pl. 11, figs. 18–21; 1899a, 152.—Kurimoto & Ijima, 1892a, 718–720.—Leuck., 1889, 404–440, figs. 181–190.—Linst., 1890f, 178 (syn. of D. westermani).—Looss, 1894a, 118, 142, 159, 180, 181, 186, 206; 1899b, 560; 1905, 84 (syn. of Paragonimus westermani); 1905m, 280.—Manson, 1895, 54–55; 1901 (Gibson), 541 (syn. of D. ringeri); 1903, 3 ed., 631 (syn. of Paragonimus westermanni).—Miyake & Matzui, 1894, 1–6, pl. 1.—Moniez, 1896, 144.—Mont., 1888, 54; 1893, 13, 33, 35, 38, 39, 83, 87, 95, 102, 105, 106, 107, 155, 157.—Mosler & Peiper, 1894, 178–179.—Otani, 1888.—Rail., 1890, 143.—Remy, 1883, 525–527, fig. 2.—Rev. sci., 1890, 189.—Schneidemuehl, 1896, 301–302.—Shaw, 1901, 600.—Simon, 1896, 225; 1897, 209, 224, 259.—Stiles & Hass., 1900a, 567.—Stoss., 1892, 32 (to Mesogonimus).—Taniguchi, 1903, Dec., 100, 105.—Taylor, 1884, 44–48, 51–52, fig. 1.—Vierordt, 1898, 158.—Vincent, 1889, 184; 1890, 189–190; 1890, 80.—Ward, 1895, 244 (syn. of D. westermanni), 328 (in Homo), 341 (in Canis familiaris); 1903, 867 (syn. of Paragonimus westermanii).—Weichselbaum, 1898, 315.—Wolf, 1903, 612.—Wood & Fitz, 1897, 336.—Yamada, 1899, (pathology); 1900 (prophylaxis).—Yamagiwa, 1890a, 457 (seu cerebrale); 1891a; 1891b; 1891c.

pulmonale colubri natricis Viborg, 1795, 243.—Dies., 1850a, 348 (syn. of D. naja).—Rud., 1809a, 434.—Ward, 1895, 244 (syn. of D. westermanni).

pulmonar La Clínica de Málaga, 1883, 308, for pulmonale.

pulmonis Kiyona, Suga & Yamagata, 1881, teste Ijima, 1889b, 148.—Braun, 1903, 3 ed., 155 (syn. of Paragonimus westermani).—Ijima, 1889b, 148.—Inouye, 1903, 120.—Katsurada, 1900d, 506 (syn. of D. westermanni).—Ward, 1895, 328 (in Homo), 341 (in Canis familiaris); 1903, 867 (syn. of Paragonimus westermanii).

pulmonum (Bælz, 1880) Tomono Hidekata, 1883 (autopsy).—Inouye, 1903, 120.—Inouye & Katsurada, 1893, 798; 1897, 995 (in brain).—Looss, 1905, 84 (syn. of Paragonimus westermani).—Riusai, 1884 (treatment).—Tomono, 1883, no. 96.—Yamagiwa, 1890.—Yamagiwa & Inouye, 1890a, 20 Sept., ———; 5 Oct., ———; 20 Oct., ———; 1890, 5 Nov., 30–40; 20 Nov., 26–38.

pulvinatum Braun, 1899, 630 (in Flussschildkrœten; Brazil); 1901b, 24–26, fig. 18.—Looss, 1902m, 515, 516.—Odhn., 1902, 42; 1902, 153.

punctatum (misprint for D. punctum Zed., 1800a, 184) Dies., 1850a, 329 (syn. of Monost. cochleariforme).—Harz, 1881c, 11.

punctum Zed., 1800a, 164, 183–184 (in Cyprinus barbus; Europe); 1803, 217.—Bremser, 1824, 134.—Cobbold, 1860a, 28 (in Barbus communis).—Crep., 1837, 326; 1839, 289.—Dies., 1850a, 377 (includes Bremser, 1824c, pl. 9, figs. 21, 22; Duj., 1845a, 463; Rud., 409, 1819a, 112).—Duj., 1845a, 463.—Harz, 1881c, 5, 10, 11 (punctatum), 152, 154.—Hausmann, 1896a, 391; 1897b, 30.—Kroyer, 1846–53a, 333 (in Barbus fluviatilis Ag.).—Nord., 1832a, 88.—Olfers, 1816, 46.—Rud., 1809a, 327, 366, 409–410; 1819a, 112–113.—Stoss., 1886, 54.

pungens Linst., 1894, 333–334, fig. 10 (in Podiceps minor; Seeburger See).

pusillum (Braun, 1790) Zed., 1803a, 210.—Braun, 1893a, 870.—Cobbold, 1860a, 7 (in Erinaceus europæus); 1879b, 295.—Crep., 1825, 55–57; 1837, 310, 326; 1841, 78.—Dies., 1850a, 360 (to Fasc.).—Duj., 1845a, 438–439.—Harz, 1881c, *3* (*pus*silum).—Olfers, 1816, 30, 44.—Rud., 1809a, 163, 384–386; 1819a, 104, *119* (*pars*, syn. of D. aluconis thoracicum).—Stoss., 1892, 33, (to Agamodist.).

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pussilum Harz, 1881c, 3 (for pus'llum).

putorii Mol., 1858, 131 (in Mustela putorius; Patavii); 1861, 224, pl. 5, fig. 4.—Braun, 1893a, 870 (in Fœtorius putorius).—Cobbold, 1860a, 9.—Dies., 1858c, 354 (in Mustela putorius).—Erc., 1881e, 56; 1882a, 292.—Linst., 1875, 192, pl. 2, fig. 14.—Stoss., 1892, 34 (to Agamodist.).—Also reported for Putorius vulgaris.

putorii (Gmelin, 1790) Rail., 1893a, 366.

pygmæum Levin., 1881a, 73–75, pl. 3, fig. 3 (in Somateria mollissima; Egedesminde).—Braun, 1892a, 578, 583, 586, 642, 720, 721, 736; 1900, 234.—Jægers., 1901, 982 (type of Spelotrema).—Looss, 1899b, 620; 1902m, 704, 705, 706, 784 (in Somateria mollissima).—Luehe, 1899, 537.—Mont., 1893, 43, 61, 83, 95.—Nicoll, 1906, 522, 523, 524.—Odhn., 1900, 13; 1905, 314 (to Spelotrema).—Stiles & Hass., 1902d, 20 (type of Spelotrema).—Stoss., 1892, 147.—Ward, 1901, 184.

pygmæum similis (Jægers., 1900) Looss, 1902m, 784.

pyramidum Looss, 1896b, 76–78, pl. 6, fig. 52 (in Rhinolopus hippocrepis Bonap.; Ghizeh); 1898, 453, 454, 456, 457, 458, figs. 1, 4.—Stiles, 1901, 200.

pyriforme Crep., 1837a, 316 (in Eisente); 1847, 142 (piriforme).—Dies., 1850a, 397 (in Anas fusca, A. glacialis).—Stoss., 1892, 186.

pyriforme Lint., 1900, 269, 279, 292–293, pl. 38, figs. 52–59 (in Palinurichthys perciformis; Woods Hole, Aug.); 1901, 415 (in Cynoscion regalis, Monticirrus saxatilis, Pal. percif.), 422, 453, 454, 457, 458, 460, 462, 483; 1905, 328, 334, 352, 360, 380, 382 (in Brevoortia tyrannus, Lagodon rhomboides, Menidia menidia).

pyxidatum Bremser in Rud., 1819a, 678–679 (in Crocodilus sclerops; Brazil).—Cobbold, 1860a, 19.—Dies., 1850a, 358 (in Champsa sclerops; Brazil).—Duj., 1845a, 452.—Leuck., 1863a, 460.—Rud., 1819a, 678–679.—Stoss., 1895, 231–232.—Also reported for Caiman sclerops, Jacare sclerops.

quietum Staff., 1900, 403–406, fig. 4 (in frogs; apparently Canada).—Type of Glypthelmins.

rachion Cobbold, 1858b, 158, pl. 31, figs. 9–10 (in Morrhua ægelfinus); 1860a, 25.—Braun, 1892a, 642.—Lint., 1898, 538–539, pl. 53, figs. 3–7; 1901, 415 (in Gadus callarias), 422, 476.—Mont., 1893, 82, 85, 86.—Nicoll, 1907, 77, 79 (syn. of Lepodora rachiæa).—Odhn., 1905, 332 (type of Lepodora) (rachiæa).—Stoss., 1886, 43 (in Gadus morrhua).

radiatum Duj., 1845a, 427–428 (in Carbo cormoranus or Pelecanus carbo), to (Echinost.), from Vien. Mus.—Dies., 1850a, 383 (syn. of D. echinatum).—Stoss., 1892, 167 (syn. of Echinost. ech.); 1898, 52.

radula Duj., 1845a, 433–434 (in Lymnæus palustris; Rennes), to (Echinost.).—Dies. 1850a, 395.—Fil., 1854a, 17.—Moul., 1856a, 203.

ragazzi Linst., 1903t, 354, for ragazzii.

ragazzii Setti, 1897, 8–12, pl. 8, figs. 6–7 (in Squalus; Eritrea), to (Polyorchis).—Ariola, 1899, 7.—Linst., 1903, 354 (ragazzi).—Looss, 1899b, 642, 644, 731, 737 (type of Syncœlium).—Par., 1896, 3, nomen nudum (in Squalus sp.; Red Sea).

rajæ Rud., 1809a, 435 (D. rajæ intestinale Viborg).

rajæ intestinale Viborg, 1795, 242.—Rud., 1809a, 435 (D. rajæ).

ralli Rud., 1819a, 120 (in Rallus aquaticus; M. C. V.).—Dies., 1850a, 339 (syn. of D. holostomum).—Duj., 1845a, 447.—Stoss., 1892, 145 (syn. of Cladocœlium holost.).

ramlianum Looss, 1896b, 36–44, pl. 3, figs. 17–19 (in Caméléon; Ramleh); 1898, 461; 1899b, 589–590 (type of Lepoderma).—Luehe, 1899, 531.—Stoss., 1904, 2.

ranæ esculentæ Dies., 1850a, 388 (syn. of D. retusum), based on Valentin, 1841, 54.

rarum Ben., 1858a, 1861a, 178 (in Cyprinus dobula).—Fraip., 1880c, 417.

rastellus Olss., 1876, 16–17, pl. 3, figs. 31–36 (in Rana temporaria).—Braun, 1892a, 736; 1893a, 881.—Linst., 1887, 97, 98, 101, 102 (syn. of D. endolobum Duj.).—Looss, 1894a, 82, 84, 85 (syn. of D. end. Duj.).—Mont., 1893, 94, 102 (rastellum).—Stoss., 1889, 66.

rathonisi Simon, 1896, 182, 192, misprint for rathouisi.

rathonisii Huber, 1894a, 2 (contents), 1896a, 575 (misprint for rathouisi; syn. of D. buskii).—Simon, 1896, 182, 192; 1897, 223.

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rathouisi Poir., 1887, 203–211, pl. 13, figs. 1–7 (in Homo); 1888, 186–187; 1888, 49.—R. Bl., 1891, 610 (syn. of D. buski).—Braun, 1892a, 568 (rathouisii), 602, 635, 638, 682, 684, 699, 704, 717, 719, 733; 1893a, 875, 882; 1895b, 141–142 (rathouisi), fig. 57 (probably identical with D. buski); 1903, 3 ed., 154, fig. 100 (rathouisi); 1906, 157–160, fig. 91.—Gamb., 1896a, 63, 70 (rathouisii).—Hoyle, 1890, 538.—Ijima, 1889b, 133 (rathouisi).—Kholodk., 1898, 26, 30, 31, pl. 11, fig. 17.—Leuck., 1889, 328–336, figs. 150, 152, 153.—Moniez, 1896, 86, 117–118.—Mont., 1893, 33 (rathousii), 83, 84 (rathouisi), 102, 107.—Stoss., 1892, 27–28 (syn. of D. crassum) (in Homo; China; India).—Ward, 1895, 328 (in Homo).

rathouisii Braun, 1892a, 568, for rathouisi.

rathousii Mont., 1893, 33, for rathouisi.

raynerianum Nardo, 1827, 68–69 (in Luvarus imperialis; Venice); 1833, 524.—Carus, 1884, 125.—Cobbold, 1860a, 28; 1879b, 460.—Dies., 1850a, 376.—Mont., 1891, 500, 520.—Stoss., 1886, 15; 1891, 112.—Also reported for Proctostegus prototypus.

receptaculum Cobbold, 1860a, 29 (D. labracis Duj. renamed, in Labrax lupus).—Odhn., 1901, 514.—Stoss., 1898, 46.

recurvatum Linst., 1873, 101, 105, 106, pl. 5, fig. 1 (in Anas marila).—Braun, 1892a, 569; 1893b, 183.—Kowal., 1894, 3; 1895, 355–356, figs. 9–11, 12c; 1895g, 1, 15), 41, 55; 1896d, (7), 257 (in Anas boschas; Fuligula marila; Dublany), to (Echinost.).—Sons., 1897, 252.—Stoss., 1892, 162 (to Echinost.).—Villot, 1878, 25.

recurvum Duj., 1845a, 410 (in Mus sylvaticus; Rennes), to (Brachylaimus).—Braun, 1899g, 492; 1901e, 339–341 (includes D. musculi Rud.; Duj.; Dies.), 341.—Cobbold, 1860a, 9; 1879b, 316.—Dies., 1850a, 389.—Stoss., 1892, 19–20 (in Mus sylvaticus; Rennes).

refertum Mueh., 1898, 18 (in Cypselus apus; East Prussia), 26, 84, 86–87, figs. 5, 12.—Braun, 1902b, 100, 109 (= clathratum Desl.).—Jacoby, 1900, 10, 11.—Looss, 1899b (to Dicrocœlium).—Rail., 1900, 239 (syn. of Dicrocœlium clathratum Deslong.).

reflexum Crep., 1825a, 54 (in Cyclopterus lumpus; Mar. and Apr.).—Bellingham, 1844a, 425.—Ben., 1858a, 1861a, 178; 1870, 51, pl. 5, fig. 3.—Braun, 1892a, 578, 699, 700, 734, 737; 1893a, 873, 910.—Cobbold, 1860a, 24.—Dies., 1850a, 373 (includes D. cyclopteri in Cyclopterus lumpus; Greifswald); 1858e, 342 (in Cyclopterus lumpus).—Duj., 1845a, 467.—Hausmann, 1897b, 4, 6, 20, 22 (in Trutta salar).—Jacoby, 1900, 11.—Kroyer, 1838–40a, 613 (in Cyclopterus lumpus).—Mont., 1893, 95, 102.—Nicoll, 1907, 73, 74.—Odhn., 1901, 484, 485, 506, 508, 509, 512; 1905, 321.—Olss., 1868, 52.—Stoss., 1886, 28.

reinhardi Linst., 1903, 280–282, fig. 16 (in Astacus leptodactylus).

renale Fil., 1855b, 19–20, 23, pl. 2, fig. 21 (in Helix adspersa near Turin); 1857, 435–436, fig. 21, pl. 2.—Dies., 1858d, 266 to Cerc. (Gymnocephala).—Erc., 1881e, 64, 65; 1882a, 300, 301.—Moul., 1856a, 164, 216 (to Cerc.) (in Helix aspera at Turin).—Par., 1894, 160.

reniferum Looss, 1898, 461 (D. unicum Looss, not Mol., renamed); 1899b, 590 (type of Astia); 1900 (type of Astiotrema).—Braun, 1901b, 37.—Luehe, 1899, 531 (reniforme).

reniforme Luehe, 1899, 531 (syn. unicum Looss, nec Mol.), 532 for reniferum Looss.—Stoss., 1904, 2.

repandum Rud., 1819a, 681 (in Rana sp.; Brazil).—Dies., 1850a, 355.—Cobbold, 1860a, 19 (in Cystignathus pachypus; Brazil).—Duj., 1845a, 454.—Stoss., 1889, 71 (in Cystignathus ocellatus).

recticulatum Wright, 1879, 58–59, pl. 1, fig. 6 (in Ceryle alcyon); 1879, 7.—Braun, 1892a, 570, 698; 1893a, 876.—Looss, 1894a, 171; 1899b (= Fasc.).—Stoss., 1892, 154.

reticulatum Looss, 1885b, 40–57, 59 (retikulatum), pl. 23, figs. 16, 20–29 (in "Wels;" Costa Rica); 1885a, 427–444; 1894a, 137, 138, 171; 1899b, 536, 585, 650, 651, (to Clinost.).—Biehringer, 1888a, 230, 231, 232, 233.—Bock, 1886a, 544.—Braun, 1892a, 603, 607, 608, 611, 615, 640, 650, 651, 664, 677, 688, 735, 741, 742; 1892, 46; 1893a, 871; 1899g, 484, 485, 486, 487, 491; 1900h, 2, 3, 4, 5, 6, 9, 13, 43, 44; 1900, 26, 31; 1902b, 129.—Jackson, 1888, 644, 645.—Linst., 1890f, 183.—MacCallum, 1899, 705, 707.—Mont., 1888a, 15, 30, 32, 38, 43, 54, 57, 92 (type of Mesogonimus); 1893, 18, 44, 65, 66, 83, 85, 88, 90, 91, 102, 106, 107, 155, *156*.—Rossbach, 1906, 377.—Stiles & Hass., 1898a, 86 (see D. dictyotus) (type *of Mesogonimus*).—Reported for Acipenser sp.

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reticulatum Poir., 1886, 39, pl. 3, fig. 8 (in Axinurus dugesii).—Braun, 1899g, 491 (syn. of Clinost. marginatum); 1900h, 44, 45.

retikulatum Looss, 1885b, 59, for reticulatum.

retroconstrictum Srámek, 1901, 95, 108, fig. 62 (syn. Monost. constrictum) (in Abramis brama Cuv.); 1902, 21 Apr., 173.

retroflexum Mol., 1859, 290 (in Belone acus; Batavii); 1861, 213.—Braun, 1893a, 910; 1893b, 184 (in Bel. vulgaris).—Carus, 1884, 124.—Dies., 1859c, 432.—Luehe, 1900, 488, 492; 1901, 480.—Stoss., 1883, 117 (in Bel. acus); 1886, 16; 1891, 216.

retusum Duj., 1845a, 405–406 (in Rana temporaria; Rennes), to (Brachycœlium).—Baillet, 1866b, 96.—Ben., 1858a, 1861a, 92–96, 178, 186, pl. 11, figs. 9–27.—Braun, 1892a, 767; 1893a, 860, 866, 881.—Cobbold, 1860a, 18 (in Rana esculenta; Valentin).—Dav., 1877a, lxxi, fig. 34.—Dies., 1850a, 388 (includes D. clavigerum; D. ranæ esculentæ); 1858, 348 (in Rana halecina); 1859c, 434 (cf. Cerc. armata minor Ben., 1858a, 98, pl. 11, figs. 9–27, in Lymnæus stagnalis; Belgium).—Erc., 1881e, 73, 82, 84, 85, 89; 1882a, 309, 318, 320, 321, 325.—Fraip., 1880c, 417.—Gamb., 1896a, 72.—Hahn & Lefèvre, 1884a, 516 (of "Rud.").—Leidy, 1851, 207; 1856, 44.—Linst., 1887, 97, 98, 99.—Looss, 1894a, 82, 84 (of Ben. is syn. of D. endolobum), 85, 208; 1899b, 611.—Luehe, 1899, 536.—Mont., 1893, 43.—Pag., 1857, 41.—Staff., 1902, 724.—Stiles, 1901, 197, 199, 201.—Stoss., 1889, 63.—Also reported for Phryganeidæ larvæ.

rhatonisii Simon, 1897, 223, misprint for rathouisii.

rhizophisæ Mont., 1888, 199 (for rhizophysæ).

rhizophysæ Studer, 1878, 12–13, pl. 1, figs. 2, 7 (in Rhizophysa conifera).—Braun, 1893a, 869; 1893d, 468.—Mont., 1888, 199 (rhizophisæ); 1893, 123.

[*rhodopyge* Sluiter, 1898 (a tunicate).]

rhombi Ben., 1870, 72 (in Rhombus maximus).—Braun, 1893a, 872.

ricchiardii Lopez, 1888, 137–138.—Looss, 1899b, 552, 736; 1901, 204, 206; 1902m, 482, 791 (amphitypie), 846, 854.

richardii Brand., 1891b, 267 (for richiardii).

richiardi Mont., 1891, 500 (for richiardii).

richiardii Lopez, 1888a, 137–138 (in Acanthias vulgaris; Risso).—Ariola, 1899, 8.—Brand., 1891b, 267 (richardii).—Braun, 1892a, 698, 715.—Crety, 1892b, 373 (vitelline nuclei of); 1892c, 396, 399 (richiardi); 1892, 24–26, fig. 2; 1892, (92–97); 1893a, 380, 382–384 (richiardi).—Linst., 1888, 46; 1903, 354.—Looss, 1894a, 134, 145, 166, 179, 189, 190, 200, 204, 210, 211, 224; 1902m, 482 (ricchiardii), 791, 846, 854, 855 (type of Probolitrema).—Mont., 1889, 132–134; 1889, 612; 1891, 500 (richiardi); 1892, 5, 6, 7 (richiardi); 1892, Oct. 7, 188 (richiardi); 1893, 17, 19, 32, 33, 34, 40, 41, 42, 43, 49, 50, 61, 62, 65, 66, 67, 68, 69, 71, 72, 76, 78, 79, 82, 83, 84, 85, 86, 87, 88, 90, 91, 94, 95, 96, 97, 98, 99, 102, 103, 106, 107, 109, 110, 112, 114, 117, 120, 122, 135, 139–148, 209, pl. 1, fig. 10, pl. 5, fig. 51–55, pl. 6, fig. 87, pl. 7, figs. 91–102, pl. 8, figs. 125–130; 1899, 103; 1896, 147, 166 (richiardi).—Ofenheim, 1900, 147, 153, 156, 160, 163, 164, 169, 174.—Shipley & Hornell, 1905, 54, 55 (in Rhinodon typicus).—Sons., 1890, 135 (richiardi).—Stiles, 1896, 205.

rigens Linst., 1878a, 282 (in Scymnodon ringens) [apparently lapsus for Dist. ligula Ben., 1871a, 12], 360 (ringens).—Ariola, 1899, 8.—Mont., 1893, 53.

ringens Rud., 1819a, 101, 385 (in Picus tridactylus; Mus. Vien.).—Braun, 1893a, 877; 1893d, 467; 1901, 561, 568.—Dies., 1850a, 361 (syn. of D. macrost.).—Duj., 1845a, 444.—Linst., 1903, 354.—Stoss., 1892, 184 (syn. of D. macrost.); 1898, 23.—Schlotthauber, 1860, 130.

ringens Linst., 1878a, 360, see rigens.

ringeri Cobbold, 1880, 139–140, pl. 10, figs. 1–3 (Homo); 1884g, 976.—Anders, 1903, 6 ed., 1245 (syn. of D. pulmonale).—R. Bl., 1888a, 627–630, 631, fig. 326; 1891, 610 (syn. of D. westermanni).—Braun, 1893a, 876, 877, 882; 1901e, 332; 1903, 3 ed., 155 (syn. of Paragonimus westermani); 1906, 161.—Brunet, 1902a, 125.—Chedan, 1886a, 241–244.—Coplin, 1898, 339–340.—Dunglison, 1893, 338.—Eyles, 1887a, 660.—Gamb., 1896a, 63.—Giard & Billet, 1892a, 614.—Hackley, 1886, 519.—Hahn & Lefèvre, 1884a, 546–548 (syn. of D. pulmonale Bælz).—Huber, 1896a, 576 (syn. of D. pulm.).—Ijima, 1889b, 148.—Inouye, 1897c, 1–4 (in brain); 1903a, 120–135; 1904a, 617–618.—Jackson, 1888a, 653.—Katsurada, 1900, 506.—Linst., 1889, 3; 1890f, 178.—Lockwood, 1901, 2 ed., 821.—Looss,

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1905, 84 syn. of Par. westermani).—Manson, 1880, Aug., 139–140, pl. 10, figs. 1–3; 1881, 8–9; 1881, July 2, 10–12, figs. 1–9; 1882, 55–62, figs. 1–25; 1882, July 8, 42–45; 1883, Mar. 31, 532–534; 1883, 1813; 1883, 134–138, 138–156, pls. 8–9; 1886, 241–244; 1893, 852–860, fig. 79; 1901, 541; 1903, 3 ed., 631 (syn. of Par. westermanni).—Moniez, 1896, 144.—Mont., 1893, 155.—Mosler & Peiper, 1894, 178.—Mouyon, 1904, v. 1, 1–2; 1904, v. 2, 144.—Packard, ——, 523.—Rail., 1886, 296.—Rail. & Marotel, 1898, 31.—Simon, 1897, 259.—Sons., 1884, 17, 18, 19, 20, 21.—Stiles & Tayler, 1902a, Apr. 19, 45.—Stoss., 1892, 32 (syn. of Mesogonimus pulmonale).—Taniguchi, 1903, Dec., 100.—Ward, 1895, 244 (syn. of D. westermanni, 328 in Homo, 341 in Canis familiaris); 1903, 867 (syn. of Par. westermanii).—Yamagiwa, 1891, 5 Jan., 36–41; 1892, 446.—In tiger.

ringers Rev. Sci., 1890, 189, misprint for ringeri.

robustum Lorenz, 1881a, 583–586, pl. 19 (in Elephas africanus), figs. 1–6.—Braun, 1892a, 593, 603.—Mont., 1893, 82, 105, 106, 107.—Stoss., 1892, 18 (in El. afr.).

rochebruni Poir., 1886, 36–37, pl. 4, figs. 4–5 (Delphinus delphis).—Braun, 1892a, 673 (rochebrunni); 1893a, 875, 910; 1893, 354; 1900g, 251, 252, 253.—Looss, 1894a, 204; 1899b, 560 (to Brachycladium).—Mont., 1893, 44, 107.—Stiles, 1895m, 219, pl. 8, figs. 4, 5.—Stoss., 1892, 11 (to Cladocœlium).

rochebrunni Braun, 1892a, 637, for rochebruni.

rosaceum Nord., 1832a, 82–88, pl. 8, figs. 1–5, 11 (in Gadus lota; October); 1840, 617, 620 (syn. of Fasc. ericois).—Ben., 1858a, 1861a, 99, 100 (syn. of D. tereticolle).—Braun, 1892a, 653, 757.—Cobbold, 1860a, 26; 1879b, 458.—Crep., 1837, 313, 314, 318, 321, 323.—Dies., 1850a, 364.—Harz, 1881c, 5.—Kroyer, 1838–40a, 609 (in Lota vulgaris).—Looss, 1894a, 5, 6 (syn. of D. teret.).—Moul., 1856a, 49 (seems to be only a var. of teret.).—Stoss., 1886, 25; 1898, 38. Wagener, 1857, 25.

rosarum Cobbold, 1860a, 21; misprint for rosaceum.

roseu Ben., 1870, 1871a, 90, pl. 4, fig. 10 (in Petromyzon omalii; Belgium).—Linst., 1878a, 290 (in P. fluviatilis).

rubelli Olss., 1868, 40, pl. 4, fig. 89 (in Labrus maculatus; Scandinavia).—Braun, 1892a, 579; 1893a, 910.—Looss, 1899b, 618; 1901d, 399.—Luehe, 1899, 537.—Odhn., 1902, 59, 61.—Staff., 1905, Apr. 11, 692.—Stoss., 1886, 20.

rubens Duj., 1845a, 411 (in Sorex fodiens, S. tetragonurus; Rennes) (to Brachylaimus).—Braun, 1901e, 342, 344 (syn. of D. exasperatum Rud.).—Cobbold, 1860a, 6; 1879b, 296.—Dies., 1850a, 334–335 (in Sorex daubentonii; Rhedoni), Stoss., 1892, 15 (syn. of D. exasp.).

[rubicum Savigny, ——, 176 (a tunicate).]

rude Dies., 1850a, 360–361 (in Lutra brasiliensis; Brazil; 1855, 66–67, pl. 3, figs. 9–10; 1858c, 341.—Braun, 1892a, 735; 1893a, 876, 877; 1899g, 492; 1901e, 327, 329, 332, figs. 12, 15, 17 (to Paragonimus).—Cobbold, 1860a, 7; 1859d, 363; 1879b, 298.—Kerbert, 1878a, 272.—Lamouroux, 1824, 563 [Distome rude].—Stiles & Hass., 1900a, 904 (to Paragonimus).—Stoss., 1892, 36 (in Lut. bras.).

ruficolle Rud., 1819a, 110, 406–407 (in Murœna conger; Naples, July).—Bellingham, 1844a, 425.—Ben., 1858a, 1861a, 178, 181, 189, 193, 195.—Braun, 1891d, 421 (in Uranoscopus scaber), 1892a, 705; 1893a, 879.—Carus, 1884, 125.—Cobbold, 1860a, 22 (in Conger vulgaris).—Dies., 1850a, 342, 371, 372 (includes D. varium Eysenhardt (in Capros aper, Naples; Labrax lupus, Rhedoni; Saurus saurus, Naples), 1858c, 342 (in Cong. vulg.).—Duj., 1845a, 421.—Jackson, 1888a, 647.—Kroyer, 1846–53a, 615 (in Anguilla conger L.).—Lander, 1904a, 7 (to Leptorhynchirum).—Levin., 1881a, 60.—Lint., 1898, 515–517, pl. 42, 43, figs. 1–4, 1902, 415, 418, 455.—Linst., 1903, 354.—Looss, 1899b, 640 (to Hemiurus).—Luehe, 1901, 58; 1901, 474, 476.—Mol., 1858, 129; 1859, 827–841, 844 (in Scorpœna porcus, S. scrofa, Anguilla vulgaris, Labrax lupus, Trigla cuculus), 1861, 205–209, pl. 2, figs. 1, 2, 4, 5.—Mont., 1888a, 7, 8, 17, 1892, 147–160, 502.—Olss., 1868, 40, 1876, 20.—Pag., 1862, 305, pl. 29, figs. 9–10.—Sons., 1850, 259, 261 (in Rhombus levis, Trigla cuculus).—Stoss., 1883, 115 (in Anguilla vulg.), 1885, 159, 1886, 13 = D. caudiporum Duj.; 1890, 40–50, 1892, 112, 1902, 382.—Wagener, 1860, 166, 178–181, 183, pl. 9, figs. 6–10.—Also reported for Acipenser sturio, Centronotus glaucus, Cepola rubescens, Conger conger, Dactylopterus volitans, Roccus lineatus, Saurus lacerta.

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saginatum Ratz, 1898, Oct. 15, 73–75, fig. 5 (in Ardea alba); 1900, 437–439.

salamandræ (Frœlich, 1789) Zed., 1803a, 215 (in Salamandra nigra).—Dies., 1850a, 356 (syn. of D. crassicolle).—Rud., 1809a, 379 (syn. of D. crassicolle).

salamandrinæ perspicillatæ Sons., 1896, 1; 1896, 116 (in Salamandrina perspicillata Say).

sanguineum Sons., 1894, 111; 1894, 1–4 (n. sp. in Chamæleo vulgaris; Gabes, Tunis); 1895, 124.—Braun, 1899b, 718; 1900, 225.—Jacoby, 1900, 11.—Looss, 1896b, 106–114, pl. 7, figs. 69–74, pl. 8, figs. 75–78 (in Taphosus nudiventris at Cairo; caméléon in Egypt); 1899b, 556, 636, 637 (type of Anchitrema).—Ofenheim, 1900, 183.—Stoss., 1895, 217 (in Camæleo vulg.; Tunisia).

sauromates Poir., 1886, 24–26, pl. 2, figs. 4–6 (in lungs of Elaphis sauromates).—Braun, 1892a, 699, 736, 737; 1893a, 876 (sauromatis).—Looss, 1894a, 204.—Luche, 1899, 532, 533; 1900, 561.—Mont., 1888a, 57; 1893, 83, 86, 95, 102, 107.—Sons., 1893, 185; 1893, 216.—Stoss., 1895, 220–221 (in Elaphis sauromates); 1904, 2.—Volz, 1899, 232, 234, 237.

sauromatis Braun, 1893, 876, for sauromates.

scaber Rud., 1819 of Odhn., 1905, 353, perhaps a Stephanochasmus.

scabrum (Mueller, 1788) Zed., 1803a, 215–216 (in Gadus barbatus).—Bellingham, 1844a, 427.—Ben., 1870, 61 to (Echinost.).—Carus, 1884, 126.—Cobbold, 1858b, 158; 1860a, 37.—Crep., 1837, 311.—Dies., 1850a, 393, 398 (in Morrhua barbata, Lota molva; Naples); 1858e, 351 (in Merlangus pollachius).—Duj., 1845a, 432–433.—Kroyer, 1838–40a, 605; 1843–45a, 41, 166 (in Gadus morrhua, Lota molva).—Looss, 1899b, 581, 582 (of Mueller, generically Hemiurus, specifically problematic) (of Rud., probably a Stephanost.).—Mont., 1891, 507, to (Fasc.).—Nicoll, 1907, 78.—Olfers, 1816, 46.—Rud., 1809a, 387, 406–408, 428, 435; 1810a, 376; 1819a, 118, to (Echinost.), 122, 124 (see also scaber).—Stoss., 1886, 34.—Also reported for Gadus pollachius, Molva vulgaris.

scimna Risso, 1826, 262 (also spelled scymna and scymni by various authors) (in Echinorhinus spinosus; Europe).—Ariola, 1899, 7 (scymni).—Dies., 1850a, 347 (syn. of D. insigne).—Mont., 1893, 52 (scymni).—Villot, 1876, 1344–1346; 1878, 3 (scymna).

scombrinum Linst., 1889a, 80, for sobrinum.

scorpænæ Rud., 1819a, 122 (in Scorpæna scrofa; C. E. V.).—Barbagallo & Drago, 1903, 410 (in Scorpæna lutea; Catania) to (Dicrocœlium).—Braun, 1892a, 569, 642, 728.—Dies., 1850a, 398.—Looss, 1899b, 571 (this form as described by Stoss., 1885, 3, 5, belongs to the Creadiinæ, possibly to Creadium).—Mont., 1893, 83, 84, 95.—Stoss., 1885, 158 (in Scorpæna scrofa; Triest); 1886, 33; 1898, 49.

scorpii (Mueller, 1776) Zed., 1803a, 216.—Dies., 1850a, 366 (syn. of D. granulum) (in Cottus scorpio).—Rud., 1809a, 395.

scymna Villot, 1878, 3, for scimna.

scymni Mont., 1893, 52, for scimna.—Ariola, 1899, 7 (syn. of D. veliporum).

scyphocephalum Braun, 1899e, 630 (in Testudo matemata; Brazil); 1901b, 34–36, fig. 14.

segmentatum Mueller, 1894, 125–127, pl. 7, fig. 10, to (Echinost.).

semiarmatum Mol., 1858, 131 (in Acipenser naccari; Patavii); 1861, 223.—Braun, 1892a, 584.—Carus, 1884, 127.—Dies., 1858e, 352.—Odhn., 1902, 159.—Stoss., 1886, 42.

semiflavum Linst., 1880, 50–51 (in Petromyzon fluviatilis).—Stoss., 1886, 54.

semisquamosum Braun, 1900b, 228–229, pl. 10, figs, 6, 7 (in Vesperugo noctula).—Looss, 1907, Mar. 7, 483 (belongs in Parabascus).

seriale Rud., 1808a, 351 (in Salmo alpinus; Greenland); 1809a, 368–370 (in Salmo alpinus), includes Fasc. umblæ, 1780; 1819a, 97.—Braun, 1893a, 876; 1893d, 467.—Cobbold, 1860a, 23; 1879b, 457 (in Salmo umbla).—Dies., 1850a, 343 (includes D. umblæ; Fasc. umblæ).—Duj., 145a, 464.—Olfers, 1816, 45.—Stoss., 1886, 54.

serpentatum Mol., 1859, 830–831 (in Sayris camperi; Padua).—Par., 1896, 18–19, fig. 7 (to Brachylaimus).—Also reported for Scomberesox rondeletti.

serpentulum Carus, 1884, 131 (for serpentatum).—Stoss., 1886, 54.

serratum Dies., 1850a, 385 (in Aranus scolopaceus; Brazil); 1855a, 67, pl. 3, figs. 14–17; 1858c, 347.—Braun, 1892a, 571.—Stoss., 1892, 171.

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sialidis Linst., 1892, 334, pl. 15, fig. 20 (in Sialis lutaria).—Braun, 1893b, 183.

sibiricum Winogradow, 1892, 116–130 (in Homo); 1892, Nov. 30, 910–911; 1900, 617–618 (in Man).—Anders, 1903, 6 ed., 1245 (in man).—Askanazy, 1900, 491, 492, 494; 1901, 73, 77 (in Tomsk, in Homo, dog, cat).—Bossuat, 1902, v. 6 (2), 188 (syn. of Opisthorchis felineus).—Braun, 1894g, 128–129; 1894h, 755; 1894i, 602–606; 1903, 3 ed., 157 (syn. of Op. fel.), 159, fig. 106.—Huber, 1896a, 576.—Kamensky, 1900a, 5, 19.—Katsurada, 1900, 500.—Kholodk., 1899a, 152.—Looss, 1899b, 674; 1905, 89 (syn. of Op. fel.).—Moniez, 1896, 137, fig. 27.—Simon, 1897, 209, 223.—Ward, 1895, 328 (in Homo); 1903, 869 (syn. of Op. fel.).—Weichselbaum, 1898, 315.

siemersii Buttel-Reepen, 1900a, 586, 589, 596–598, figs. 8–9 (in Sphyræna barracuda; Atlantic Ocean); 1902, Dec. 8, 165–236, pl. 6, fig. 26, pl. 10, fig. 54, text fig. h; 1904, Jan. 26, 24–25; 1905, July, 52–53.—Darr, 1902, 668, 671.

signatum Duj., 1845a, 415–416 (in Coluber natrix; Rennes) to (Brachylaimus.—Braun, 1891, 100; 1892a, 780, 784, 785; 1893a, 864, 866, 873; 1901b, 13, 16 (of Erc., syn. of D. ercolanii Mont.).—Cobbold, 1860a, 20.—Dies., 1850a, 390 (in Tropidonotus natrix); 1858e, 350 (in Tropidonotus).—Gamb., 1896a, 72.—Hoyle, 1890, 538.—Kampmann, 1894b, 454, 456, 457, pl. 20, fig. 10.—Linst., 1879, 185.—Looss, 1899b, 706.—Luehe, 1899, 528 (of Erc., not Duj.).—Mont., 1893, 187, 188.—Mueh., 1898, 30.—Schauinsland, 1882, 496.—Sons., 1893, 186.—Stoss., 1895, 216–217; 1898, 34.—Volz, 1899, 235, 237.—Wedl, 1855, 400–401, pl. 2b, fig. 8.—West, 1896, 323.—Also reported for Natrix torquata.

signatum of Erc., 1881c, 73, 74, 75, 76, 78, 79, 81, 82; 1882a, 309, 310, 311, 312, 314, 315, 317, 318, pl. 2, figs. 2–5 (in Tropidonotus natrix), renamed D. ercolanii by Mont., 1893, 187, 188, pl. 6, fig. 67.—Braun, 1901b, 13, 16.—Luehe, 1899, 528.—Par., 1904, 1.—Stoss., 1904, 1.

simile Sons., 1890, 105 (in Python molurus); 1893, 215, 216; 1893; 185 (in Py. mol.); 1893, 499.—Looss, 1899b, 602.—Luehe, 1899, 532.

simile Looss, 1899b, 602 (see Hæmatolœchus similis).—Stiles, 1901, 178.—Stiles & Hass., 1902d, 20 (renamed Hæmatolœchus similigenus).

simillimum Mueh., 1898, 18 (in Fuligula nyroca); 1898, 26, 96–97, 98, figs. 4, 19.—Braun, 1902b, 11, 18.—Looss, 1899b, 574 (to Psilost.).

simplex Rud., 1809a, 370–371 (in Gadus æglefinus), Fasc. æglefini Mueller, 1776, renamed; 1819a, 97.—Braun, 1892a, 642, 699, 711, 728, 736; 1893a, 866, 879.—Cobbold, 1858b, 157.—Dies., 1850a, 343–344.—Duj., 1845a, 466.—Kroyer, 1838–40a, 606 (in Gadus æglefinus).—Lamouroux, 1824a, 563 (distome simple).—Levin., 1881a, 18, 67–69, pl. 3, fig. 1 (of Olss., syn. Fasc. æglefini) (larva in Themisto libellula; adult in Cottus scorpius; Phobetor ventralis; Egedesminde); 1876, 15.—Lint., 1898, 525–526, pl. 47, figs. 3–7; 1900, 295; 1901, 415 (Hemitripterus americanus, Leptocephalus conger, Limanda ferruginea, Microgadus tomcod), 420, 436, 451, 468, 475, 482, 483, 485, 486, figs. 331, 332; 1905, 328, 334, 397 (in Micropogon undulatus).—Linst., 1889a, 97 (in Conger vulgaris).—Mont., 1893, 61, 83, 86, 94, 102, 105, 106, 107.—Nicoll, 1907, 70, 73 (of Olss., syn. of Podocotyle atomon).—Nord., 1840, 619 (syn. of Fasc. æglefini).—Odhn., 1901, 484, 485, 506, 508, 509, 510, 511, 512, 513; 1905, 320–321 (of Olss., syn. of Podocotyle atomon) (to Sinistroporus, designated type in letter to Stiles, May 15, 1905).—Olfers, 1816, 45.—Olss., 1868, 34; 1876, 15.—Staff., 1904, 484.—Stoss., 1886, 30–31 (in Anguilla vulgaris, Cottus scorpius, Gadus æglefinus, G. melanostomus, Lota vulgaris, Phobetor ventralis, Raniceps niger, Sebastes norvegicus); 1902, 582.—Also reported for Conger vulgaris.

simplex Rud. of Olss., 1868, 34; 1876, 15.—Levin., 1881, 67–69 (syn. Fasc. æglefini) (larva in Themistone libellula; adult in Cottus scorpius, Phobetor ventralis; Egedesminde).—Odhn., 1905, 320–321 (syn. of Podocotyle atomon).

simplex Polonio, 1859, teste Par., 1894, 147 (in Lacerta muralis; Padua).

simulans Looss, 1896b, 52–54, pl. 4, figs. 28–30 (in Pernis apivorus; Alexandria); 1899b, 673 (to Opisthorchis).—Jacoby, 1900, 7.

sinense Cobbold, 1875i, Sept. 18, 423 (in Homo); 1875, Oct., 780–781; 1876, 97 (same as chinense and macconnelli); 1877, Jan., 15–16; 1883, 401; 1884g, 976.—Bælz, 1883, 234.—Biggs., 1890a, 30–37, 1 fig. (in U. S. A.).—Billet, 1893a, 506–510, figs. 1–2 (syns.: D. hepatis perniciosum, D. hepatis innocuum, D. japonicum).—R. Bl., 1888a, 585, 596, 615–618 (syn. D. spathulatum *Leuck.), 622* (similar to D. japonicum), 631; 1891, 605, 607–609, 610 (syns.:

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D. japonicum Bl., D hepatis endemicum sive perniciosum, D. hepatis innocuum); 1901b, 209; 1901c, 586 (to Opisthorchis).—Braun, 1891d, 426; 1893, 349, 352, 353; 1893a, 875; 1893f, 386, 425, 427, 428; 1894i, 605; 1895b, 146–147, figs. 63–64; 1903, 3 ed., 161 (to Opisth.).—Bruce, 1897a, 211–212.—Brunet, 1902a, 125.—Caræs, 1888a, ——, pl. 2 (liver flukes of man in Orient); 1888, 44 pp., 4 figs.—Chester, 1887a, 360.—Corlette, 1897a, 146–147 (Australia).—Delafield & Prudden, 1897, 130.—Gamb., 1896a, 63, 70.—Giard, 1904, 8.—Grall, 1887a, 468, 1 fig; 1887, xlviii.—Hackley, 1886, 518–519, fig. 883.—Hahn & Lefèvre, 1884a, 544–545 (syns. D. spathulatum Leuck., D. hepatis innocuum Bælz).—Hori, 1890.—Huber, 1896a, 577 (syn. of D. spatulatum Leuck.).—Ijima, 1889b, 145.—Jamieson, 1897a, 71–74, 1 fig. (jaundice); 1897b, 147–148.—Janson, 1893c, 265–266.—Katsurada, 1891; 1900, 479.—Kholodk., 1898, 26, 28, pl. 11, figs. 6–9; 1899a, 152.—Kuech., 1881, 333–335, pl. 8, fig. 10A.—Kurimoto, 1893a, 1–7, 21–24, 35–39, 1 pl. (in Saga, Japan); 1893b, 67–69, 85–87, 109–111.—Linst., 1903, 279.—Looss, 1905, 90 (to Opisth.); 1907, Feb. 1, 136, 137, 141, 142, 143, 144, 147.—MacGregor, 1877, 3–16, 1 pl.—McConnell, [1875, 271–274; 1876, 343 (sineuse); 1878, March 16, 406 (m'connelli)].—Manson, 1901 (Gibson), 540; 1903, 3 ed., 631, 635–637, 639.—Moniez, 1896, 86, 123, 125–136, 137, fig. 25 (excellent discussion).—Mosler & Peiper, 1894, 177–178, fig. 70 (sinese).—Moty, 1893, March 3, 224–230 (pathology).—Nakahama, 1883, ——.—Pfihl, 1884, 156.—Rail., 1890, 142, 143.—Remy, 1883, 513.—Schneidemuehl, 1896, 302.—Simon, 1897, 223.—Sons., 1889, 278, 279, 280; 1889, 7 July, ——; 1896, 297, 302.—Staff., 1902, 483 to (Opisth.).—Stoss., 1892, 23 (syn. of D. endemicum).—Taylor, 1875, 772–780, figs. 1–3; 1884, 48–51, 52–53; 1885, 58–60.—Tyson, 1903, 3 ed., 1180.—Vallot, 1889, 382.—Ward, 1895, 238 (man, cat), 328 (in Homo); 1903, 869 (to Opisth.).—Weichselbaum, 1898, 315.—White, 1902, Dec., 523 (cases in U. S. A.).—Wood & Fitz, 1897, 335.

sinese Mosler & Peiper, 1894, 177–178, fig. 70 (for sinense).

sineuse of McConnell, 1876, 343 (misprint for sinense).

singulare Mol., 1859, 288 (in Ibis falcinellus); 1861, 200–201, pl. 2, fig. 6, pl. 3, fig. 3.—Braun, 1891d, 421; 1892a, 578, 700, 736, 737; 1901, 260; 1901, 896; 1902b, 86 (syn. of Stomylotrema pictum Crep.).—Dies., 1859c, 428 (in Ibis falcinellus; Patavii).—Looss, 1899b, 723 (type of Stomylus).—Stoss., 1892, 162.

singulare Mol. of Looss, 1899b, 723.—Braun, 1902b, 86 (renamed Stomylotrema perpastum).

sinuatum Rud., 1819a, 97–98, 374 (in Ophidium imberbe; Naples).—Braun, 1883a, 41; 1891d, 421; 1892a, 672, 763, 765.—Carus, 1884, 131.—Cobbold, 1860a, 25.—Dies., 1850a, 344 (in Fierasfer imberbe).—Duj., 1845a, 468.—Odhn., 1901, 484, 490, 491; 1902, 160.—Par., 1902, 6 (in Ophidium barbatum; Portoferrajo).—Stoss., 1886, 55.—Will.-Suhm, 1870, 7–8; 1871, 181–182, pl. 11, fig. 6.—Also reported for Fierasfer acus.

siredonis Poir., 1886, 32–33, pl. 3, figs. 4–5 (in Siredon mexicanus, int.).—Looss, 1894a, 204, to Opisthioglyphe.—Mont., 1893, 83, 86, 102, 107.

sirenis Braun, 1893a, 870 for sirenis lacertinæ Vailliant.

sirenis lacertinæ Vailliant, 1863, 348–350, pl. 9, fig. 9 (in Siren lacertina).—Stoss., 1889, 69.

sluiteri (Brock, 1886) Braun, 1892a, 651.

sobrinum Levin., 1881a, 70–71 (in Cottus scorpius; Egedesminde).—Looss, 1899b, 581 (to Stephanost.).—Odhn., 1905, 331 (to Stephanochasmus).—Also reported for Aspidophorus decagonus.

soccus Mol., 1858, 129 (in Mustelus plebejus; Patavii); 1861, 203.—Ariola, 1899, 7 (syn. of D. megastomum).—Braun, 1893a, 873.—Dies., 1858e, 351 (in Mustelus plebejus).—Jacoby, 1900, 17.—Linst., 1903, 354.—Mont., 1893, 53, 192, 193.—Stoss., 1883, 118; 1890, 131; 1898, 38.

sociale Luehe, 1901p, 171–173 (in Bufo melanostictus Schneider).—Braun, 1901h, 700.—Klein, 1905, 20, 78.—Odhn., 1902, 42.

solea Duj., 1845a, 417–418 (in Pleuronectes solea; Rennes) to (Brachylaimus).—Dies., 1850a, 399.—Kroyer, 1838–40a, 612 (in Solea vulgaris).—Mont., 1893, 193.—Stoss., 1886, 55.—Wagener, 1860, 184.

soleæforme Rud., 1809a, 384 (in Trigla gurnardus) (D. triglæ gurnardi renamed); 1819a, 104.—Braun, 1893a, 873.—Cobbold, 1860a, 26.—Dies., 1850a, 382.—Duj., 1845a, 457.—Fraip., 1881b, 4 (in Tr. gur.).—Kroyer, 1838–40a, 100 (in Tr. *gur.).—Olfers, 1816, 45.*—Stoss., 1886, 55.

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soleare Braun, 1899e, 629–630 (in Testudo midas); 1901b, 22–23, fig. 8.

somateriæ Levin., 1881a, 71–73, pl. 3, fig. 2 (in Somateria mollissima; Egedesminde).—Braun, 1892a, 578, 579, 586, 642, 735; 1893a, 893, 910.—Giard, 1903g, 1225.—Jægers., 1898, 15, 16; 1900, 738.—Jameson, 1902a, 140–166, 4 pls., 3 figs.—Linst., 1890, 179.—Looss, 1894a, 173; 1899b, 618, 619; 1901, 207.—Luche, 1898, 624, 625; 1899, 537.—Mont., 1888a, 12, 38; 1893, 43, 61, 83.—Odhn., 1900, 12, 13; 1905, 311 (to Gymnophallus), 313.—Staff., 1905, Apr. 11, 692.—Stoss., 1892, 146.

sophiæ Stoss., 1886, 44–45, pl. 8, figs. 34–35 (in Pagellus mormyrus; Triest); 1898, 49–50.—Braun, 1892a, 644, 720, 728.—Looss, 1899b, 571 (thinks this belongs to Creadiinæ, possibly to Creadium); 1902m, 785 (cf. D. isoporum armatum).—Mont., 1893, 85, 94, 102.—Odhn., 1905, 328, 338.

soricis Dies., 1858c, 354 (in Sorex araneus) (based on Distome (Dicrocœlium) de la Musraigne-Musette Pontaillié, 1853, 103).—Braun, 1893a, 875.—Cobbold, 1860a, 9.—Stoss., 1892, 36 (in Crocidura aranea).

soricis aranei Dies., 1855, 64, footnote 3, to (Dicrocœlium).

spari Rud., 1819a, 122 (in Sparus erythrinus, S. smaris; C. E. V.).—Dies., 1850a, 399.—Stoss., 1886, 55 (in Pagellus erythrinus, Smaris vulgaris).

spathaceum Rud., 1819a, 109, 403 (in Larus glaucus; Mus. Vien.).—Baird, 1853a, 48.—Crep., 1837, 310; 1839, 287.—Dies., 1850a, 310 (to Hemist.).—Nitzsch, 1819, 400.—Nord., 1840, 628 (to Holost.).

spathulatum Leuck., 1876, 871–872 (nec Crep., 1849) see Opisthorchis sinensis (see also D. spatulatum) (in Homo); 1889, 336–355, figs. 154–161.—R. Bl., 1888a, 615 (syn. of D. sinense); 1901b, 209; 1901c, 586 (syn. of Op. sin.).—Brand., 1891b, 265; 1891c, 731; 1891d, 11.—Braun, 1883a, 65; 1892a, 598, 602, 641, 661, 669, 671, 682, 699, 700, 704, 707, 712, 714, 717, 719, 724, 725, 732, 733, 784, 785; 1893, 349; 1903, 3 ed., 161 (syn. of Op. sin.).—Cobbold, 1876, 97; 1883, 401.—Duffek, 1902a, 774.—Gamb., 1896, 63.—Hahn & Lefèvre, 1884a, 544 (syn. of D. sinense Cobb.).—Harz, 1881c, 5.—Huber, 1896a, 577–578.—Ijima, 1889b, 145.—Inoue, 1900a, 1–60, 18 charts; 1903, 107–146.—Jamieson, 1897b, 147 (spatulatum) (syn. of D. sinense).—Katsurada, 1891b, 1–12, 1 pl. (case of cystoma hepatis); 1898a, 165–167 (relation to gallstones); 1900b, 479–505, pl. 13, figs. 1–13; 1900c; 1901a, 169–174; 1902a, 50–52; 1904, v. 2 (3), 22; 1904, Dec., 148 (in cats and dogs).—Laspeyres, 1904a, 16 pp. (case).—Looss, 1894a, 180, 186, 206, 212, 214; 1899b, 564; 1905m, 280 (syn. of Op. sin.); 1905, 90 (syn. of Op. sin.); 1907, Feb. 1, 141 (syn. of D. sinense).—MacGregor, 1877, May 26, 775–776 (in Homo).—Mont., 1888a, 39, 52 (spatulatum), 57; 1891, 110; 1893, 83, 84, 86, 95, 102, 105, 106, 107.—Mosler & Peiper, 1894, 177.—Rail., 1890, 143.—Saito, 1898, June 5, ——; 1906, Sept. 10, 133–138, figs. 1–10; 1906, Sept. 20, 1555.—Sons., 1889, 278 (spatulatum).—Vogt, 1878, 10, 14.—Ward, 1903, 870 (syn. of Op. sin.).—Yamagiwa, 1891, 5 March; 1901, xxx, 155–168, fig. 1.

spathulatum Rud. (nec Leuck.) of Crep., 1837, 310; 1839, 287; 1849, 66–67.—Braun, 1901b, 29.—Kowal., 1896d, (3), 253 (in Botaurus minutus; Dublany), to (Echinost.) for spatulatum; 1902d (9), 27 (to Sodalis).—Looss, 1902m, 462.

spathulatum hepatis Simmonds, 1901, 110–111.

spatula Duj., 1845a, 394 (in Accentor modularis; Rennes) to (Dicrocœlium).—Dies., 1850a, 336.—Stoss., 1892, 156.

spatulatum Rud., 1819a, 109, 403–404, 600 (in Ardea minuta; Vienn. Mus.).—Bremser, 1824c, pl. 9, figs. 15–16.—Crep., 1829b, 4.—Dies., 1850a, 367 (to Holost.).—Duj., 1845a, 376.—Harz, 1881c, 5.—Nitzsch, 1819, 400.—Nord., 1840, 628 (to Holost.).—Stoss., 1892, 186 (in Ardetta minuta; Vienna).—Also reported for Botaurus minutus.

spatulatum Cobbold, 1879b, 28 (for spathulatum Leuck.).—Aschoff, 1892, 495.—Askanazy, 1900c, 712.—Hoyle, 1890, 538.—Huber, 1896a, 277–278.—Jamieson, 1897b, 147.—Mont., 1888, 52.—Simon, 1897, 209, 223.—Stoss., 1892, 23 syn. of D. endemicum Bælz).—Ward, 1895, 328 (in Homo).

spatulatum (endemicum) Anders, 1903, 6 ed., 1245 (in man).

species Barbagallo & Drago, 1903, 410 (in Mugil cephalus; Catania).

species Barbagallo & Drago, 1903, 410 (in Julis pavo; Catania).

species Barbagallo & Drago, 1903, 410 (in Trachurus trachurus; Catania).

species Duncker, 1881d, 141; 1884a, 39–42, figs. 1–6.

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species Heymann, 1905, 96–98, figs. A. B.

species Johnstone, 1907, 186–188, fig. 17 (in Labrus mixtus; Morecambe Bay).

species Kellicott, 1894, 123–126.

species Nicoll, 1907, 70, 92 (in Cottus scorpius Bloch).

species Nicoll, 1907, 71, 91–92, pl. 3, fig. 12, pl. 4, fig. 13 (in Cottus bubalis)

species Nicoll, 1907, 71, 92 (in Gobius ruthensparri).

species Nicoll, 1907, 72 (in Pleuronectes microcephalus).

species Sons., 1890, 105, t. h. Python molurus.

sphærostomum Schlotthauber, 1860, 130 (in Corvus caryocatactes).

sphærula Looss, 1896b, 81–86, pl. 6, figs. 59–60 (in Rhinolophus hippocrepis Bonap.; Ghizeh); 1898, 454, 456, 457, figs. I, VI; 1899b, 547.—Stiles, 1901, 200.

spiculator Duj., 1845a, 424–425 (in Mus decumanus; Rennes) to (Echinost.).—Braun, 1901e, 340.—Cobbold, 1879b, 316.—Dies., 1850a, 382.—Erc., 1881e, 15; 1882a, 251.—Linst., 1886, 128–131, pl. 9, figs. 28–29; 1890, 184.—Stoss., 1892, 28 (to Echinost.).

spiculigerum Much., 1898, 18–19 (in Fuligula nyroca); 1898, 4, 26, 97–100, fig. 18.—Braun, 1902b, 11, 15 (to Psilost.), 16 (syn. of D. oligoon), 18, 155.—Looss, 1899b, to Psilost.

spiniceps Looss, 1896b, 114–118, pl. 8, figs. 79–80 (in Bagrus bayad; Cairo); 1899b, 578, 581 (type of Acanthost.).—Braun, 1899, 630; 1901b, 34.

spinosum Linst., 1880, 51 (in Sylvia rufa).—Braun, 1892a, 696, 733.—Looss, 1894a, 175.—Luehe, 1899, 531 (thinks this is perhaps D. cirratum).—Stoss., 1892, 162.

spinulosum Rud., 1808a, 458; 1809a, 425 (in Larus cinerarius, L. nævius, Colymbus septemtrionalis; Greifswald, July, August) to (Echinost.); 1819a, 116 (in Colymbus cristatus; Mus. Vien.), 419.—Baird, 1853a, 56.—Bellingham, 1844a, 426.—Braun, 1892a, 575; 1893a, 879.—Crep., 1837, 316; 1846, 141, 144, 146.—Dies., 1850a, 392; 1858e, 350, 351 (in Numenius arquatus; Anas clangula; Larus capistranus; L. ridibundus; Podiceps cristatus).—Duj., 1845a, 430.—Linst., 1877, 183, pl. 13, fig. 14.—Mol., 1858, 130–131; 1861, 220–221, pl. 3, fig. 6, pl. 4, fig. 2.—Mueller, 1897, 20–21, pl. 3, fig. 4.—Nord., 1832a, 90, 102.—Olfers, 1816, 47.—Stoss., 1892, 64 (in Larus ridibundus; Triest); 1892, 169 (to Echinost.).—Reported for Anas boschas fera, A. marila, A. querquedula, Carbo graculus, Ceryle rudis, Colymbus cristatus, C. septentrionalis, Halieus graculus, Uria grylle).

spinulosum Hofmann, 1899a, 184, 193, 201.—Braun, 1899, 492 (in Erinaceus europæus) to Harmost.; 1900, 12; 1901e, 338 to Harmost., 341.—Looss, 1899b, 689.

"*spinulosum*" of Mol., 1861, pl. 4, fig. 2 (is not E. spinulosum, see Looss 1899b, 689, but perhaps a Stephanost.).

spirale (Dies., 1850) Brand., 1892, 507.—Braun, 1899, 631–632; 1901b, 54.—Stoss., 1895, 232 (in Peltocephalus tracaxa, Testudo tabulata, Hypsilopus tuberculatus).

spirale Fil., see Par., 1896, 2 (in Dentex vulgaris).

squamata Kerbert, 1881a, 556 (in Rana temporaria) for squamula.

squamosum (Villot, 1878) Brand., 1890a, 577.—Braun, 1892a, 569, 735.

squamula Rud., 1819a, 103, 391 (in Mustela putorius; Mus. Vien.).—Baird, 1853a, 52.—Brand., 1892, 506.—Braun, 1890a, 439; 1892a, 567, 568, 571, 628, 636, 637, 638, 640, 641, 642, 647, 648, 655, 678; 1893a, 866, 871, 880.—Bremser, 1824, pl. 9, figs. 9–10.—Crep., 1837, 326; 1839, 288.—Dies., 1850a, 321 (to Monost.) (in Mustela putorius; Toulouse).—Duj., 1845a, 406, type of Eurysoma.—Fraip., 1880a, 398; 1880b, 106; 1880c, 419, 420–429, 430, 432, 433, 441, 442, 443, pl. 18, figs. 1–17 (in Rana temporaria, larva; Mustela putorius, adult); 1881b, 1, 3, 4, 14; 1883a, xxxvii.—Gamb., 1896, 72.—Jackson, 1888, 645.—Kampmann, 1894b, 446, 448.—Levin., 1881a, 75.—Linst., 1873, 99.—Looss, 1885b, 20.—Maddox, (1867a), 87–99 (in Morrhua æglefinus).—Mont., 1888a, 7, 41, 43, 45; 1893, 62.—Poir., 1885, 102.—Stiles & Hass., 1898a, 88, 98 (type of Eurysoma).—Stoss., 1892, 20 (in Putorius putorius; Putorius vulgaris; Vienna, Tolosa).—Zeller, 1867, 21 Mar., 213–220, pl. 13, figs. 1–4 (in grass frog).—Also reported for Fœtorius putorius.

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sternæ cantiacæ Dies., 1858e, 355 (in Sterna cantiaca), based on LaValette, 9, 37, pl. 1, figs. 15, 1. 2., and Moul., 1856, 102.—Stoss., 1892, 186.

stossichii (Mont., 1891) Braun, 1891d, 423 (=D. ocreatum Mont.) (in Clupea pilchardus); 1893a, 911.

stridulæ Reich, 1801, 371–386 (in Strix stridula).—Brand., 1888a, 9.—Dies., 1850a, 386.—Pulteney, ——, 371.—Rud., 1809a, 423 (renamed D. apiculatum).

sturionis Rud., 1809a, 435 (in Acipenser sturio; Arimini); 1819a, 118 (syn. of D. hispidum).—Baird, 1853a, 57.—Dies., 1850a, 392 (syn. of D. hispidum).

subclavatum (Gœze, 1782) Zed., 1800a, 164 (in Rana), 185–188.—Ben., 1858a, 1861a, 81, 82 (to Amphist.).—Brand., 1888a, 9.—Dies., 1850a, 318 (to Diplodiscus).—Rud., 1809a, 348.

subflavum Sons., 1892, 91–92 (in Zamenis viridiflavus Lacep.); 1893, 184.—Braun., 1893b, 185 (in Z. virid.).—Stoss., 1895, 216 (in Z. virid.; Pisa).—Volz, 1899, 235, 237.

subtriquetrum Nord., 1840, 616 [the sequence of names is D. amphist., D. subtriquetrum, apparently a lapsus for Amphist. subtriquetrum].

sulcatum Linst., 1883, 309, pl. 9, fig. 51 (in Perdix græca; Turkestan); 1886, 33.—Braun, 1901, 941; 1902b, 119.—Stoss., 1892, 145 (to Cladocœlium).

suspensum Braun, 1901g, 948 (in Corvus sp.); 1902b, 11, 147.

sygnoides Nord., 1840, 617 for D. cygnoides.

tacapense Sons., 1894, 111–112; 1894, 2–6, 7 (in Ch. vulg., Rana esculenta, Bufo sp.; Gabes in Tunis) to (Brachycœlium); 1895, 124 (in Chamæleo vulgaris).—Looss, 1896b, 86–97, pl. 6, figs. 61–62, pl. 7, fig. 63 (in caméléon; Alexandria); 1898a, 460, 461, fig. 2; 1899b, 616, 617, 622 (syn. of D. medians Olss., based on reexamination of original slides).—Stoss., 1895, 215 (in Ch. vulg.; Tunisia).

talpæ Viborg, 1795, 242.—Rud., 1809a, 331, 390.

tarda Steenstrup, 1842, 75–76, pl. 3, figs. 1–6 (Cerc. armata Sieb., renamed) [name not mentioned in text].—Dies., 1850a, 298 (p. 138 of Steenstrup as syn. of Cerc. armata), 418 (p. 138, pl. 3, fig. 5e–g of Steenstrup as ? syn. of Heptast. hirudinum); 1855a, 381, 388 (syn. of Cerc. (Xiphidioc.) armata); 1858e, 366 (of 1850a, 418, syn. of Tetracotyle typica, new name).—Erc., 1881e, 21, 48, pl. 2, fig. 6; 1882a, 257, 284.—Fil., 1854a, 10, 15, 22.—Moul., 1856a, 150, 151, 201, 215, 226, 227, 230 (in Lymnæus stagnalis, Planorbis corneus).

tartinii Stoss., 1899, 6, pl. 1, fig. 13 (in Oblata melanura; Triest).

tectum Linst., 1873, 104, pl. 5, fig. 4 (in Osmerus eperlanus).—Odhn., 1905, 352, 353 (=crenata 1802, type of Brachyphallus).—Stoss., 1886, 55.

tenere Looss, 1898, 461 ("D. tacapense Sons," of Looss, 1896, 86, misdetermined) to Pleurogenes.

tenerum Looss, 1899b, 616 to (Pleurogenes), 622.

tenue Lint., 1898c, 535–536, pl. 52, figs. 2–8 (in Roccus lineatus); 1900, 294; 1901, 415, 455, 468, 469, 479; 1905, 328, 334, 365, 370, 373, 374, 376, 379, 386, 391, 396, 399 (in Caranx hippos, Centropristes striatus, Coryphæna equisetis, C. hippurus, Cynoscion nebulosus, Menticirrhus americanus, Micropogon undulatus, Orthopristis chrysopterus, Pomatomus saltatrix, Sciænops ocellatus).—Odhn., 1905, 331.

tenue tenuissime Lint., 1898c, 536–537, pl. 52, figs. 9–12 (in Morone americana); 1901, 415, 421, 456 (in Roccus lineatus, Opsanus tau).—Vaullegeard, 1901, 146.

tenuicolle Rud., 1819a, 93, 365–366 (in Phoca barbata, liver).—Braun, 1893, 353; 1893a, 875; 1893f, 426, fig. 4; 1901e, 314–315, 338; 1903, 3. ed., 157 (of Mueh., 1896, p. p., syn. of Opisthorchis felineus).—Cobbold, 1860a, 6–7; 1879b, 313.—Dies., 1850a, 336–337.—Duj., 1845a, 440, 444.—Jægers., 1898, 6.—Looss, 1899b, 530, 674.—Mueh., 1896, 589 (D. felineum as syn.); 1896, 257–262, figs. 4, 11; 1898, 16, 24, 87, 88, 89, 90, 95.—Odhn., 1905, 347 (Rud. of Olss).—Olss., 1893, 9.—Stiles & Hass., 1894c, 428.—Stoss., 1892, 18–19 (in Phoca barbata).—Ward, 1903, 869 (syn. Op. fel.).—Reported for Erignathus barbatus, Delphinus phocæna, Felis domestica, Halichœrus grypus, Phocæna phocæna.

tenuissime (Lint., 1898) Vaullegeard, 1901, 145 (=D. tenue tenuissime).

tereticolle (Rud., 1802) Rud., 1809a, 379–381, 405 (in Esox lucius, Perca lucioperca, Salmo trutta); 1819a, 102, 122, 386, pl. 2, fig. 5, 600.—Ben., 1852, 24–29, 33, pl. 2, figs. 1–3; 1858a, 1861a, 98, 104, 174, 177, 178, 186, 189, 193, 206, pl. 8,

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figs. 1–17 (syns. D. rosaceum, D. lucii, Fasc. longicollis, F. lucii, Plan. lucii); 1870c, 140, 141, 142.—Bettend., 1897a, 31; 1897, 335.—R. Bl., 1888a, 544, 545, 547.—Brand., 1888a, 41; 1890a, 570.—Braun, 1883a, 70; 1892a, 568, 574, 575, 644, 653, 727, 745, 747, 757, 761, 763, 768, 778, 779, 780, 781, 782, 784, 786, 787, 788, 789; 1893a, 872, 873, 879, 883, 911; 1901b, 33; 1901c, 314, 315, 338.—Bremser, 1824c, pl. 9, figs. 5–6.—Cobbold, 1860a, 21.—Crep., 1837, 310, 311, 313, 314, 316, 317, 318, 321, 322, 323, 325.—Creutzberg, 1890a, 21.—Dies., 1850a, 358 (syns. D. luzii, D. truncatum Abildg., F. longicollis, F. lucii, Plan. lucii); 1858d, 272 (larva ? Rhopalocerca tardigrada); 1858e, 340 (in Esox estor); 1859c, 429.—Duj., 1845a, 419–420.—Fil., 1855b, 24, 25; 1857c, 29.—Fischer, 1840, 158.—Fraip., 1880c, 417, 443.—Harz, 1881c, 5 (syn. of D. lucii Zed.).—Hausmann, 1897b, 4, 6, 14, 15, 17, 20, 21, 22 (in Esox lucius, Thymallus vulgaris).—Jackson, 1888, 649.—Johnston, 1902, 329.—Jurine, ——, 489.—Kowal., 1894, 2; 1894, 220; 1895, 372–390, pl. 8, fig. 10.—Kœlliker, 1843, 99–101, 130, 135, 137.—Kroyer, 1838–40a, 41, 615; 1843–45a, 644; 1846–53a, 253 (in Esox lucius, Lucioperca sandra, Salmo fario, S. trutta).—Kuech., 1855, 187.—Lander, 1904a, 19.—Leidy, 1851b, 206; 1856b, 44; 1904a, 48, 87 (terreticolle).—Leuck., 1863a, 457, 459, 460, 485, 490, figs. 147, 148, 159.—Looss, 1893b, 813, 815; 1894a, 2, 5–18, 20, 22, 25, 28, 29, 31, 109, 113, 115, 116, 117, 118, 120, 124, 125, 136, 137, 142, 144, 147, 148, 149, 150, 151, 152, 153, 154, 159, 165, 166, 167, 176, 179, 181, 184, 185, 187, 188, 189, 197, 200, 202, 205, 206, 212, 215, 219, 241, 245, 270, 272, 275, 276, pl. 1, figs. 1–3, pl. 3, figs. 53–63, pl. 4, figs. 64–71, 74, pl. 6, fig. 121 (syns. D. lucii, D. rosaceum, Fasc. lucii, Plan. lucii) (in Esox lucius, Lota vulgaris, Lucioperca sandra, Salmo fario, S. hucho, S. alpinus, S. trutta, S. umbla, Trutta variabilis); 1894, 17; 1896b, 109; 1899b, 548, 549, 570; 1902m, 456, 457.—McIntosh, 1864, 150.—Mont., 1888a, 25, 27, 32, 43, 68, 69, 72; 1892, Oct. 7, 185, 187, 191; 1893, 16, 60, 115; 1896, 152, 153.—Moul., 1856a, 25, 31, 32, 49.—Mueh., 1898, 30.—Nord., 1840, 617, 619, (syn. of Fasc. longicollis Bloch).—Ofenheim, 1900, 152.—Olfers, 1816, 45.—Olss., 1876, 18; 1893, 11.—Poir., 1885, 102.—Schauinsland, 1882, 494, 496, 497,—Sieb., 1835, 59, 66, 82; 1836, 233, 237.—Sons., 1891, 264 (in Esox lucius).—Sramek, 1901, 96, 105, figs. 58–59 (syns. Fasc. lucii Mueller, F. longicollis Bloch, F. teret. Rud., Plan. lucii Gœze, D. lucii Zed.).—Stoss., 1886, 25; 1890, 50; 1891, 216; 1898, 38; 1904, 199.—Tennent, 1906, 670.—Wagener, 1857, 25, 28, 45, pl. 20, figs. 1–5 (in Esox lucius).—Wolf, 1903, 610.—Also reported for Esox reticulatus.

tereticolle lucii Mayer, 1841a, 18.

tereticolle rosaceum (Nord., 1832) Dies., 1850a, 364.

tereticollis Blainv., 1828a, 585 (for Fasc. tereticollis Rud.).

teretiusculum Mont., 1893, 40, 41, 42, 43, 82, 83, 94, 96, 98, 102, 118, 193, pl. 1, fig. 4; pl. 6, fig. 66 (in Solea klenii).—Jacoby, 1900, 4.

tergestinum Stoss., 1889, 28, pl. 13, fig. 57 (in Oblata melanura; Triest); 1898, 44.—Braun, 1892a, 579.—Mont., 1893, 84, 86, 95.

terreticolle Leidy, 1904a, 48, 87, for tereticolle.

testudinis Rud., 1819a, 121 (in Testudo orbicularis; C. E. V.).—Braun, 1899, 630.—Dies., 1850a, 325 (syn. of Monost. delicatulum).—Duj., 1845a, 451.—Stoss., 1895, 232 (in Emys orbicularis; Vienna).

testudinis midæ Braun, 1899, 629 (for mydæ).

testudinis mydæ Rud., 1809a, 433, for D. intestinalis testudinis mydæ.—Braun, 1899, 629 (midæ).

tetracystis Gastaldi, 1854, 4–5, pl. 1, figs. 1–3 (in Rana esculenta).—Braun, 1893a, 871.—Cobbold, 1860a, 17.—Dies., 1855, 390; 1858d, 253 (larva=Cerc. (Acanthocephala) microcotyla); 1858e, 348 (stat. juven. in Pelophylax esculentus; larva in Paludina achatina; P. vivipara).—Fil., ——, 30, pl. 1, fig. 9.—Linst., 1873, 1 (larva=Cerc. microcotyla Fil.).—Staff., 1900, 405, 410–412.—Stoss., 1889, 68 (in Rana esculenta; Torino).—Also reported for Rana catesbiana.

tetracystis ranæ esculentæ Dies., 1855, 64, footnote 9. See tetracystis.

texanicum Francis, 1891c, 135–136, pls. 3–8, 5 figs. (in Bos taurus; Texas); 1892, 426.—Huber, 1896a, 576 (syn. of D. magnum).—Leuck., 1892b, 797, 798 (texicanum).—Stiles, 1892e, 148; 1892g, 732–733; 1898a, 51.—Ward, 1895, 253 (syn. of Fasc. magna), 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus); 1903, 866 (syn. of Fasc. magna).

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texicanum Leuck., 1892b, 797, 798 (for texanicum).

tincæ (Modeer, 1790) Rud., 1809a. 366.

tobiani Krœyer, 1846–53a, 592 (in Ammodytes tobianus).

todari delle Chiaje, 1841, 139.

tornatum Rud., 1819a, 684–685 (in Coryphæna equiselis; C. hippuris).—Braun, 1893a, 872.—Buttel-Reepen, 1902, 167, pl. 6, fig. 8.—Cobbold, 1860a, 28 (in Megalops cyprinoides); 1879b, 458, 461.—Cohn, 1902k, 47.—Dies., 1850a, 372–373 (syns. F. caudata, F. coryphænæ, F. coryphænæ hippuridis, D. coryphænæ); 1859c, 431.—Duj., 1845a, 421–422.—Johnston, 1901, 337.—Lint., 1898c, 513–514, pl. 42, figs. 6–12; 1901, 415, 418, 442, 444, 452, 455, 469, fig. 310 (in Coryphæna hippurus, Fundulus heteroclitus, Menidia notata, Roccus lineatus); 1905, 328, 334, 355, 356, 372, 374, 398, 399, figs. 156–158 (in Coryphæna equisetis, C. hippurus, Menticirrhus americanus, Synodus fœtens, Tylosurus marinus).—Looss, 1896b, 125 to (Apoblema); 1899b, 640.—Mont., 1891, 497.—Stoss., 1886, 12.—Wagener, 1860, 166, 176–178, 181, pl. 9, figs. 1–5 (in Coryphæna sp.).

torosum (Setti, 1897) Linst., 1903, 354.

torulosum Rud., 1814a, 104–105 (in Silurus glanis); 1819a, 111 (in S. glanis; Greifswald, October), 410.—Cobbold, 1860a, 28.—Dies., 1850a, 375.—Duj., 1845a, 464.—Kroyer, 1846–53a, 137 (in S. gl.).—Olfers, 1816, 46.—Stoss., 1886, 56.

totari E. Bl., 1847a, 309, for todari.

trachea (Montagu, 1811) Rud., 1819a, 114 (in Phasianus gallus; Gryphiæ), 798 (sub D. lineare).

tranversale (Rud., 1802) Rud., 1809a, 361–362 (in Cobitis fossilis); 1819a, 95, 368.—Braun, 1893a, 873.—Cobbold, 1860a, 22 (in Acanthopsis (Cobitis) fossilis, Cobitis pæmiæ).—Dies., 1850a, 339.—Duj., 1845a, 463–464.—Kroyer, 1846–53a, 563, 573 (in Cob. fos., Botia tænia).—Odhn., 1901, 484, 505.—Pavesi, 1881, 616.—Stiles & Hass., 1898a, 95.—Stoss., 1886, 56.

trapezium Leidy, 1891a, 414 (in Pandion carolinensis); 1904a, 235.—Stiles & Hass., 1894e, 414.

triangulæ Linst., 1878, 72, for triangulare.

triangulare Dies., 1850a, 351 (in Merops apiaster) (syn. D. meropis).—Braun, 1901, 561, 568; 1902b, 51, 52, 53, 93 (to Plagiorchis).—Cobbold, 1860a, 13.—Linst., 1878, 92 (triangulæ).—Looss, 1899b, 531, 631, 725 (type of Megacetes); 1900, 602 (type of Eumegacetes).—Stoss., 1892, 186; 1904, 2.

tricolor Stiles & Hass., 1894h, 160–162, fig. 2; 1895a, 729–737, pls. 1–2, figs. 1–8 (in Lepus sylvaticus, L. americanus; Maryland); 1895c, 700–701.

trifolium Braun, 1901g, 947 (in Ardea cocoi; Brazil); 1902b, 150–151, figs. 92, 93.

triganocephalum Kampmann, 1894b, 454, 457, misprint for trigonocephalum.

triglæ Rud., 1819a, 122 (in Trigla cuculus; C. E. V.).—Dies., 1850a, 399.

triglæ gurnardi Rathke, 1799, 68, 146, fig. 2a–c (in Trigla gurnardus).—Dies., 1850a, 362.—Rud., 1809a, 384 (syn. of D. soleæforme).

triglæ pini Dies., 1855, 64; 1858e, 343 (renamed D. homœostomum), based on Bellingham, 1844, 428.

trigonocephalum (Rud., 1802) Rud., 1809a, 415–418 (in Ursus melis, Erinaceus europæus, Mustela putorius, M. vulgaris) (includes Plan. putorii; P. melis; Fasc. putorii; F. melis; Dist. melis; F. armata; D. armatum); 1810a, 376; 1819a, 114.—Baird, 1853a, 55.—Bellingham, 1844a, 425.—Blainv., 1824a, 512 (type of festucaire).—Brand., 1891b, 265; 1891d, 16.—Braun, 1891, 100; 1892a, 618, 754, 784, 785, 786, 787, 797; 1893a, 866, 879, 911.—Cobbold, 1879b, 295, 298 (in Erinaceus europæus, Mustela vulgaris), 299.—Crep., 1837, 310, 311, 317, 326; 1845, 327, 337, 349b.—Dies., 1850a, 381–382 (syns. D. armatum; Fasc. armata; F. melis; F. putorii; Plan. melis; P. putorii); 1858d, 267 (larva=Histrionella ephemera Ehrenberg); 1858e, 344 (in Erinaceus europæus; Mustela putorius).—Duj., 1845a, 423.—Fil., 1855b, 24.—Gamb., 1896, 72.—Giebel, 1857, 265.—Kampmann, 1894b, 454, 457 (triganocephalum).—Kowal., 1896d, (3) 253 (in Putorius fœtidus; Dublany).—Leuck., 1863a, 460, 471.—Linst., 1873, 101, 106 (larva=Cerc. echinatoides Fil.) in Fœtorius putorius; 1879, 185, pl. 12, fig. 31.—Looss, 1885b, 13, 18, 21, 37, 38, 50, pl. 23, figs. 6, 17; 1894a, 227; 1902m, 804, 805.—Mol., 1858, 129-130;

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1859, 825, 846 (in Erinaceus europæus; Padua); 1861, 213–216, pl. 3, fig. 2.—Mont., 1888a, 40, 44, 65; 1893, 75, 77.—Nord., 1840, 621 (to Fasc.).—Olfers, 1816, 46.—Rail., 1893a, 365.—Schuberg, 1895, 178.—Sieb., 1854, 23.—Sons., 1893, ——.—Stoss., 1890, 51; 1892, 29–30 (to Echinost.).—Wagener, 1857, 24, 42.—Reported for Canis vulpes; Felis catus domesticus; Fœtorius lutreola; F. putorius; F. vulgaris; Lutra vulgaris; Meles europæus; Meles taxus; Mustela foina; Mustela martes; M. putorii; M. vulgaris; Plecotus communis; Putorius vulgaris; Ursus meles; Paludina vivipara.

trilobum Rud., 1819a, 104–105, 392 (in Pelecanus carbo; Mus. Vien.).—Dies., 1850a, 310 (to Hemist.).—Duj., 1845a, 449.

tringæ helveticæ Rud., 1819a, 120 (in Tringa helvetica; C. E. V.).—Dies., 1850a, 386 (syn. of D. cinctum).—Duj., 1845a, 447.—Stoss., 1892, 187 (in Tr. helv.; Vienna).

troncatum Perroncito, 1882, 284, for D. truncatum [Erc.].

truncatum (Abildg., 1806) Rud., 1814a, 105–106; 1819a, 122 (in Perca lucioperca).—Dies., 1850a, 358 (?syn. of D. tereticolle).—Kroyer, 1838–40a, 41, 579 ("of Leuck.," in Lucioperca sandra Cuv.).—Nord, 1832a, 88.

truncatum (Rud., 1819) Rail., 1886, 296–297; 1893a, 364 (syns. Dist. conus Crep., 1825, [not Gurlt, 1831]) to (Brachylaimus).—Askanazy, 1901, 72.—Braun, 1893c, 349, 350, 352, 353, 354; 1893f, 384, 385, 387, 389, 390, 392, 424, 425, 427 (syns. D. conus Crep., D. campanulatum Erc.); 1893g, 802, 803 (syn. D. campanulatum Erc., 1875); 1894g, 129; 1894i, 606.—de Jong, 1896a, 2, 3, 4, 5, 6, 7, fig. 3; 1897a, 245–246.—Kholodk., 1898. 29.—Looss, 1896b, 97; 1899b, 565 to (Metorchis).—Moniez, 1896, 137 to (Dicrocœlium), 139 (=conus Crep.), 140, 141.—Mueh., 1898, 15, 24, 25.—Neumann, 1892, 529 ; 1892, 544.—Pease, 1898, 82.—Perroncito, 1886, 250.—Ratz, 1898, 68; 1900, 141 (in cat).—Stiles & Hass., 1894e, 421–434, pl. 3, figs. 11–12, to (Dicrocœlium) (in Phoca vitulina, Felis catus dom., Canis fam., C. vulpes, Halichœrus fœtidus, Gulo borealis; Germany, Holland, Italy, France) (syns. D. conus Crep.; D. lanceolatum of Mehlis, of Dies., 332; D. campanulatum Erc.).—Ward, 1895, 243 (in part, syn. of D. felineum Riv.), 341 (in Canis fam.).—Zwaardemaker, 1890, 197–203, pl. 3.

truncatum Erc., 1859a, 382 (in Canis familiaris).—Braun, 1893a, 875; 1893e, 349 ("Ercolani 1846"), 351; 1893f, 386, 424 ("Ercolani 1846, in dog; Bologna), 425, syn. of D. truncatum (Rud.).—de Jong, 1887a, 57; 1896a, 6, 7, 11, figs. 1a, 1b.—Leuck., 1889, 357.—Perroncito, 1882, 284 (troncatum) in dog.—Sons., 1889, 276, 277, 280; 1889, 281 (syn. of D. conus Crep.).—Stoss., 1892, 25 (syn. of D. conus Crep.).

truncatum Leuck., 1842, 34–35, pl. 1, fig. 8a–b (in Sorex fodiens).—Braun, 1893a, 876; 1893d, 467; 1901e, 342.—Cobbold, 1860a, 8; 1879b, 296.—Dies., 1850a, 374 (in Sorex daubentonii).—Duj., 1845a, 438 (in S. fodiens).—Sons., 1889, 276 (in S. fod.).—Stoss., 1892, 36–37 (in Crossopus fodiens).

truttæ Dies., 1858e, 356 (in Salmo trutta), refers to Moul., 1856, 217.—Braun, 1893a, 871.

tubarium Rud., 1819a, 111–112, 410 (in Sciæna umbra; Spezia, August).—Carus, 1884, 125.—Cobbold, 1860a, 28.—Dies., 1850a, 375.—Duj., 1845a, 457.—Stoss., 1886, 56 (in Umbrina vulgaris).

tubipórum Braun, 1900, 388–389 (in Vespertilio sp.); 1900, 232–233, pl. 10, figs. 8, 9.

tubulatum Rud., 1819a, 675–676 (in Muræna sp.; Brazil).—Cobbold, 1860a, 22.—Dies., 1850a, 337.—Duj., 1845a, 468.—Stoss., 1886, 56.

tumidulum Rud., 1819a, 95, 369 (in Syngnathus hippocampus; Vienna).—Bellingham, 1844a, 423.—Ben., 1870, 89, pl. 5, fig. 5.—Carus, 1884, 129.—Cobbold, 1860a, 22.—Dies., 1850a, 339–340; 1858e, 333 (in Syngnathus acus; Ireland).—Duj., 1845a, 469.—Kroyer, 1846–53a, 704 (in Siphost. acus L.).—Odhn., 1901, 484, 503.—Pag., 1862, 305.—Stoss., 1886, 56 (in Hippocampus guttatus, Syngnathus acus).

turdi Rud., 1819a, 120 (in Turdus saxatilis; C. E. V.).—Dies., 1850a, 361 (syn. of D. mesostomum), 391 (syn. of D. nephrocephalum).

turgidum Brand., 1888, 247–251, pl. 17, figs. 2–3 (in Rana esculenta).—Braun, 1892a, 568, 578, 579, 584, 700, 720, 721, 727, 737; 1893a, 877, 881, 893; 1895b, 11; 1900h, 6.—Galli-Valerio, 1898n, 373.—Kowal., 1894, 3.—Looss, 1892, 101; 1894a, 1, 173; 1899b, 623, 775 (type of Brandesia).—Mont., 1893, 84, 85.—Mueh., 1898, v. 1 (1), 23, 30, 102–105, 114, fig. 21, 28.

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tursionis Marchi, 1873, 304, pl. 5, fig. b (in Delphinus tursio).—Carus, 1884, 125.—Linst., 1886, 125.—Par., 1896, 1-3 (syn. of D. (Dicrocœlium) longissimum Poir.).—Poir., 1886, 30.—Stoss., 1892, 37 (in Del. tur.).

umblæ (Fabricius, 1780) Zed., 1803a, 212.—Dies., 1850a, 343 (syn. of D. seriale) (in Salmo umbla; Greenland; kidneys).—Rud., 1809a, 369.

umbrinæ Stoss., 1885, 159, pl. 4, fig. 18 (in Umbrina cirrhosa; Triest); 1886, 26; 1887, 91; 1898, 36–37.—Barbagallo & Drago, 1903, 410 (in Umbrina cirrhosa; Catania).—Braun, 1892a, 728, 737.—Lint., 1900, 290.—Luehe, 1900, 487.—Mont., 1893, 94.

uncinatum Zed., 1803a, 221 (in Fulica chloropus).—Ben., 1858a, 1861a, 85.—Braun, 1891, 101; 1893a, 874.—Crep., 1837, 316.—Dies., 1850a, 384 (syns. D. chloropodis, Fasc. crenata) (in Gallinula chloropus).—Duj., 1845a, 428.—Mueller, 1897, 22–23, pl. 3, fig. 6.—Olfers, 1816, 46.—Rud., 1809a, 420–421 to (Echinost.); 1814a, 102; 1819a, 115, 417–418.—Sieb., 1854, 23.—Stoss., 1892, 172 (syn. of Echinost. cinctum); 1898, 53.—Also reported for Ascolopax gallinago.

unicum Looss, 1896b, 44–49, pl. 3, figs. 20–24 (in Trionyx nilotica; Cairo, Egypt); 1898, 461 (renamed D. reniferum Looss); 1899b, 590 (=renifera, type of Astia).—Luehe, 1899, 531.

unicum Mol., 1859, 835–837, pl. 3, fig. 1 (in Centrolophus pompilius; Padua).—Braun, 1893a, 910.—Carus, 1884, 124.—Luehe, 1900, 488, 492.—Stoss., 1886, 17.

urcatum Luehe, 1900, 489 (for D. furcatum).

vagans Leidy, 1850, 304–309, pl. 43, figs. 2–16 (in Helix alternata, H. albolabris) (D. helicis Leidy, 1847, renamed); 1857, 44 (syns. D. helicis Leidy; D. pericardium Crep.; Cercariæum helicis alternatæ Dies.; C. vagans Dies.).—Ben., 1858a, 1861a, 175, 186, 205.—Dies., 1855a, 398, (to Cercariæum); 1858d, 278 (to Cercariæum).—Fraip., 1880c, 417.—Mont., 1888a, 40.

valdeinflatum Stoss., 1883, 114, pl. 1, fig. 4 (in Gobius jozo; Triest); 1886, 35.—Braun, 1893a, 871.—Carus, 1884, 127.—Lint., 1898c, 527–528, pl. 47, figs. 10–14, pl. 48, figs. 1–2; 1901, 416 (in Alutera schœpfii, Menidia notata, Spheroides maculatus), 421, 444, 464; 1905, 328, 334, 359, 366, 372, 379, 386, 393, 396, 400, 401, 409, 414 (in Cynoscion nebulosus, Leiostomus xanthurus, Menticirrhus americanus, Micropogon undulatus, Monacanthus hispidus, Opsanus tau, Orthopristis chrysopterus, Paralichthys albiguttus, Rachycentron canadus, Siphostoma fuscum; Trachinotus carolinus).—Linst., 1903, 354 (syn. of D. cesticillus Mol.).—Looss, 1894a, 252 (syn. of Echinost. cesticillus); 1899b, 697 (young of Stephanost. cesticillus).—Mont., 1891, 121; 1893, 61, 158, 160, 161.—Nicoll, 1907, 69 (valdemflatum).

valdemflatum Nicoll, 1907, 69 (for valdeinflatum).

validum Linst., 1886, 124–128, figs. 23–27 (in Delphinus sp.; South Atlantic); 1889a.—Braun, 1892a, 591, 603, 608; 1893a, 873.—Buttel-Reepen, 1902, 169, 171, 172, pl. 6, fig. 24.—Stoss., 1892, 15–16 (in Delphinus sp.; Atlantic).

vallei Stoss., 1896, 129, fig. 2 (in Falco subbuteo); 1898, 33.—Looss, 1902m, 746.

variabile Leidy, 1856, 44 (in Tropidonotus sipedon).—Braun, 1893a, 876.—Dies., 1858e, 352–353.—Luehe, 1900, 559–561.—Pratt, 1903, 31.—Stoss., 1895, 232–233 (in Trop. sip.; Philadelphia).—Volz, 1899, 234, 235.—West, 1896, 323.

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variegatum Rud., 1819a, 99, 378–379 (in Rana esculenta; Berlin, October).—Baird, 1853a, 53.—Ben., 1870c, 141.—E. Bl., 1847, to Brachylemus.—Braun, 1897a, 1459; 1892a, 784 (varigatum); 1893a, 876, 881, 911.—Cobbold, 1860a, 17.—Crep., 1829, 58–59; 1837, 310, 322, 326; 1839, 288.—Darr, 1902, 654.—Dies., 1850a, 354–355 (to Brachylemus); 1858e, 339 (in Rana pipiens, Pelophylax esculentus).—Duj., 1845a, 416–417.—Gronkowski, 1902a, 511, 515, 518–519, 531–532 (4, 8, 11–12, 24–25), pl. 13, figs. 3, 11, 12.—Hausmann, 1897b, 27.—Kamensky, 1900a, 8.—Leuck., 1863a, 490.—Leidy, 1851, 207, 242; 1856, 44.—Linst., 1883, 309; 1886, 34; 1887, 97.—Looss, 1892, 65, 93 (varigatum); 1893b, 812, 815, 818, 819, fig. 3; 1894a, 2, 3, 65, 68, 71–82, 113, 114, 115, 116, 118, 119, 120, 121, 125, 127, 135, 136, 146, 150, 159, 163, 167, 173, 175, 179, 182, 190, 193, 199, 204, 208, 209, 210, 212, 214, 215, 217, 221, 224, 226, 227, 230, 242, 256, 266, 268, pl. 2, figs. 43–48, pl. 7, figs. 134–146 (syns. D. cylindricum, D. cylindraceum, Monost. bombynæ, M. ellipticum) (in Rana esculenta, Bombinator igneus; Bufo cinereus); 1896b, 19; 1899b, 556, 661 (type of Hæmatolœchus), 602, 603; 1901, 192; 1902m, 732 (type of Pneumonœces), 810.—Luehe, 1899, 533; 1901, 58.—Mehlis, 1831, 177–179.—Mol., 1859, 828–829, pl. 3, fig. 2 (syn. Brachylemus v.) (in Pelophylax esculentus; Europe).—Mont., 1892, 715.—Much., 1898, 26.—Pag., 1857, 41–42, pl. 5, fig. 2 (in green frog).—Poir., 1885, 102.—Sons., 1893, 185, 188, 189 (in Rana esculenta).—Staff., 1900, 405, 409; 1902, 482 (in Canadian frogs and toads); 1902, 24 Nov., 895, 904 (American representatives); 1903, 15 Dec., 901; 1905, July, 50–51.—Stiles & Hass., 1898a, 84; 1902d, 20.—Stoss., 1889, 62; 1896, 128; 1898, 35.—Wagener, 1857, 25, 102, pl. 21, figs. 1–2.—Wright, 1879, 8.—Also reported for Bufo vulgaris, Rana halecina, R. temporaria, Triton alpestris.

varigatum Looss, 1892, 93, for variegatum.—Braun, 1892a, 784.

[*variolosus* Gærtner in Pallas (a tunicate)].—Lamarck, 1816, 101.

varium Eysenhardt, 1829, 148–151 (in Gadus merluccius).—Dies., 1850a, 342 (syn. of D. caudiporum), 371 (syn. of D. appendiculatum), 372 (syn. of D. grandiporum and of D. rufoviride).—Mol., 1859, 826 (syn. of D. grandiporum).—Mont., 1891, 498.—Wagener, 1860, 166.

velellæ Filippi (1843), 66, pl. 5, fig. 12 (in Velella spirans; Naples).—Dies., 1850a, 379, 659 (renamed D. megacotyle).—Kœlliker, 1849, 53.—Mont., 1888, 198, 199; 1893, 123.

veliporium Johnston, 1902, 329, for veliporum.

veliporum Crep., 1837a, 310 (in Squalus griseus), 318.—Ariola, 1899, 7, 9 (syns. D. insigne Dies., D. microcephalum Baird, D. scymni Risso).—Braun, 1892a, 567, 586, 624, 625, 647, 682, 686, 690, 735; 1893a, 873, 879, 910; 1893d, 466.—Carus, 1884, 129.—Cobbold, 1860a, 25 (in Prionodon milberti, Hexanchus griseus).—Darr, 1902, 666, 667, 669, 683.—Dies., 1850a, 347 (syn. Fasc. squali grisei) (in Prionodon milberti; Hexanchus griseus; Panormi).—Duj., 1845a, 471 (in Squalus griseus).—Jægers., 1900, 72, 73, 74; 1900, 736.—Johnston, 1902, 329 (veliporium).—Kerbert, 1881a, 541.—Linst., 1903, 279, 354.—Lint., 1898, 521–522; 1901, 416 (in Raja lævis), 421, 431.—Lœnnberg, 1891, 71; (1898), 4.—Looss, 1894a, 152, 211; 1899b, 570 (thinks this form may belong to Azygia).—Mont., 1888a, 7; 1889, 69; 1889, 70 (in Raja sp.; Porto Huite, Chile); 1889, 321; 1892, 5, 6, 7; 1893, 9; 1893, 33, 34, 36, 43, 52, 82, 102, 107, 113, 120, 122, 147, 191, pl. 1, fig. 6, pl. 8, figs. 122–131.—Ofenheim, 1900, 164.—Olss., 1868, 22; 1876, 13; 1896, 508 (includes D. insigne, D. microcephalum).—Poir., 1885, 22, 37, 42, 44, 48, 49, 53, 74, 82, 106, 127, 142.—Stoss., 1886, 19; 1890, 51; 1901, (9) 97, pl. 6, fig. 1 (in Notidanus griseus; Triest); 1904, 198, 199.—Villot, 1878, 2 (in Hexanchus griseus, Prionodon milberti).—Wagener, 1852, 543; 1857, 28; 1860, 174.—Reported for Acanthias vulgaris, Carcharias milbertii, Centrolophus pompilus, Chimæra monstrosa, Echinorhynus spinosus, Heptanchus cinereus, Hexanchus griseus, Raja batis, R. clavata, R. fullonica, R. lævis, R. lineata, R. radiata.

ventricosa Ben., 1871a, 68, pl. 4, fig. 11.—Braun, 1891d, 423.—Mont., 1891, 510 (syn. of Apoblema ocreatum Rud.).

ventricosum (Pallas, 1774) Mont., 1893, 26, 27.—Braun, 1893b, 184.—Stoss., 1900, 8.—Reported for Pimelepterus sp.

ventricosum Rud., 1819a, 108, 398 (in Clupea alosa; Arimini, April).—Ben., 1858a, 1861a, 179, 193; 1870, 68.—Bl., 1891, 468–478, fig. 36.—Buttel-Reepen, 1902, 166, 167, 168, pl. 6, figs. 19–22.—Carus, 1884, 125.—Cobbold, 1860a, 27.—Darr, 1902, 666.—Dies., 1850a, 369 (in Alosa vulgaris; Arimini).—Duj., 1845a,

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465.—Hausmann, 1897a, 4, 6, 20, 23 (in Al. vulg.).—Jackson, 1888, 647.—Kroyer, 1846–53a, 218 (in Alosa finta Cuv.).—Lander, 1904a, 1.—Mont., 1887, 87; 1891, 12 (syn. of Apoblema appendiculatum), 16, 17 (p. p. syn. of Apoblema ocreatum (Rud.) Mont.); 1891, 496, 497, 498, 499, 500, 501, 502.—Nicoll, 1906, 525 (in Gasterosteus aculeatus).—Sons., 1890, 12–13; 1891, 259 (syn. of D. ocreatum Mol.) (in Alosa sardina).—Stoss., 1886, 11; 1887, 90; 1898, 29; 1902, 582.—Wagener, 1860, 166–172, 173, 175, 179, pl. 8, figs. 1–7 (in Clupeiden).—Also reported for Anguilla vulgaris, Clupea sp., C. sprattus, Motella communis, M. mustela.

ventricosum Stoss., 1898, 29 (syn. of Apoblema ocreatum Rud.).

ventricosum Rud. of Wagener, 1860, 166–172, 173, 175, 179, pl. 8, figs. 1–7 (in Clupeidæ).—Braun, 1891d, 423.—Levin., 1881a, 59 (syn. of D. appendiculatum Rud., Mol.).—Luehe, 1901, 396, 397, 399.—Mont., 1891, 499, 501, 502, 505 (syn. of Apoblema appendiculatum Rud.).

ventricosum minor Shipley, 1900, 540 (in Pimelepterus sp.; New Britain).

vereticolle lucii Rud., 1809a, 440 (misprint for D. tereticolle lucii).

verrucosum Busch, 1851, 100, pl. 15, fig. 11 (in Ophidium barbatum).—Braun, 1893a, 873.—Carus, 1884, 128.—Mont., 1893, 27, 94, 102.—Stoss., 1886, 19 (in Oph. barb.).

verrucosum Lint., 1892, 96–97, pl. 6, figs. 33–35 (in Larus californicus).

verrucosum Mol., 1859, 842–844 (in Labrax lupus; Rhedoni, Padua) (includes D. labracis Duj., 1845a, 398).—Braun, 1892a, 579, 642, 720, 728, 737.—Lander, 1904a, 8.—Odhn., 1901, 513, 514.—Par., 1899, 5; 1902, 4 (syn. of Dicrocœlium labracis).—Stoss., 1886, 31; 1886, 48 (in Labrax lupus; Triest); 1898, 46.

verrucosum Poir., 1885, 10–11, 16, 29, 60, 74, 79, 81, pl. 23, fig. 4 (in Thynnus).—Braun, 1892a, 576, 608, 609, 873; 1893d, 466.—Jægers., 1900b, 72.—Lander, 1904a, 8.

verrucosum Frœlich.—Wolffhuegel, 1900, 136 (for Monost. ver.?).

vespertilionis (Mueller, 1784) Zed., 1803a, 214.—Dies., 1850a, 387 (syn. of D. lima).—Kolenati, 1857, 12.—Rud., 1809a, 427 (syn. of D. lima).—Stoss., 1904, 2.

vexans Braun, 1901, 947 (in Turdus merula); 1902b, 151–152, figs. 94–95.

vibex Lint., 1900a, 269, 281, 291–292, pl. 38, figs. 48–51 (in Spheroides maculatus); 1901b, 416 (in Sph. mac.; Woods Hole, Mass.), 419, 464; 1905d, 328, 334, 402, fig. 188.

viperæ Linst., 1877, 186 (in Pelias berus).—Braun, 1893a, 870.

virgula Fil., 1837a, 338, fig. 5 (in Paludina impura, Valvata piscinalis; Ticini); 1855b, 5.—Dies., 1850a, 296 (to Cerc.).—Moul., 1856a, 161 (to Cerc.).

vitellatum Linst., 1875, 189–190 (in Totanus hypoleucos); 1887, 104.—Braun, 1902b, 50 (to Plagiorchis).—Stoss., 1892, 154 (in Actites hypoleucos; Ratzeburg); 1892, 12, to (Brachylaimus); 1904, 2 (vitellatus).

vitellilobum Olss., 1876, 14 (in Rana temporaria).—Braun, 1893a, 873, 881; 1893d, 466.—Linst., 1887, 97, 98, 102.—Looss, 1894a, 56, 57, 62, 82; 1899b, 606–607 (whether a good species or only a variety of Gorgodera cygnoides can not be determined from Olsson's description); 1902m, 851 (perhaps a Gorgoderina), 857 (to Gorgoderina as possible).—Sons., 1893, 187 (in Rana esculenta).—Stoss., 1889, 67.

vitellosum Lint., 1900a, 269, 282, 290, pl. 37, figs. 38–39 (in Merluccius bilinearis; Woods Hole, Mass.); 1901b, 16, 420, 435, 436, 437, 439, 440, 445, 446, 449, 451; 458, 460, 462, 464, 471, 474, 481, 482, 483, 485, 486, figs. 333–340; 1905d, 329, 335, 348, 351, 357, 366, 369, 378, 382, 385, 388, 390, 393, 396, 397, 399, 401, 404, 405, 409, 413, figs. 176–178.—Johnstone, 1907, 182–185, fig. 15 (in Pleuronectes flesus; Piel).—Reported for Anguilla chrysypa, Bairdiella chrysura, Brevoortia tyrannus, Clupea harengus, Cynoscion regalis, Dasyatis centrura, Decapterus macarellus, Lagodon rhomboides, Leiostomus xanthus, Leptocephalus conger, Limanda ferruginea, Menticirrhus americanus, M. saxatilis, Merluccius bilinearis, Micropogon undulatus, Monacanthus hispidus, Opsanus tau, Orthopristis chrysopterus, Paralichthys albiguttus, P. dentatus, Pomatomus saltatrix, Pomolobus pseudoharengus, Pseudopleuronectes americanus, Prionotus scitulus, P. tribulus, Sciænops ocellatus, Sarda sarda, Scomber scombrus, Spheroides maculatus, Stenotomus chrysops, Tautoglabrus adspersus, Trachinotus carolinus, Tylosurus marinus).

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[*vitreum* Sars (a tunicate).]

vitrinæ Targioni Tozzetti, 1873, 335–336 (in vitrine).

vitta Duj., 1845a, 418 (in Mus sylvaticus; Rennes) to (Brachylaimus).—Braun, 1901c, 340.—Cobbold, 1879b, 316.—Dies., 1850a, 396.—Stoss., 1892, 13 (in Mus sylv.; Rennes).

viverrini Poir., 1886, 27–29, pl. 3, figs. 1–3 (in liver of Felis viverrinus).—Braun, 1892a, 699; 1893a, 875; 1893f, 425; 1893, 350, 352, 353.—Looss, 1899b, 675.—Mont., 1888a, 58; 1893, 43, 83, 86, 95, 102, 105, 106, 107.—Stiles & Hass., 1894c, 427–428 to (Dicrocœlium).—Stoss., 1892, 24.

vivipara Ben., 1870, 1871a, 28, pl. 3, figs. 3–4 (in Mugil chelo; Belgium).—Braun, 1891d, 424 (in Mugil cephalus); 1892a, 784.—Hahn & Lefèvre, 1884a, 516 (viviparum).—Looss, 1902, 129, 137.—Sons., 1891, 253, 254–255 (in Mugil cephalus).—Stoss., 1898, 51 (in Mugil chelo; Triest).

viviparæ fasciatæ Linst., 1877b, 186 (in Vivipara fasciata); 1878a, 322.

viviparum Olss., 1868, 28–29, pl. 4, figs. 73–75 (in Pleuronectes microcephalus; Scandinavia).—Braun, 1892a, 785, 786; 1893a, 873.—Looss, 1901, 439, 442.—Mont., 1893, 82.—Nicoll, 1907, 82.—Odhn., 1902, 59, 61.—Sons., 1891, 255 (in Pleuronectes microcephalus).—Stoss., 1886, 38.

volvens Nord., 1833, 321, pl. 19, for Diplost. volvens.

vulpina Abildg., 1790, 63–64, pl. 5, figs. 6 a–c (syn. Alaria).—Baird, 1853a, 46.—Brand., 1888a, 60 (syn. of Hemist. alatum).—Dies., 1850a, 308 (syn. of Hemist. alatum).—Nitzsch, 1819, 399 (syn. of Holost. alatum).—Rud., 1809a, 403.

wachniæ Rud., 1819a, 122, 427, based on Tilesius, 1810, 363, 374, pl. 19, figs. 8–10 (in Gadus wachnia).—Cobbold, 1858b, 157 (= D. simplex, D. fulvum).—Dies., 1850a, 398 (in Gadus wachnia).—Rud., 1819a, 122, 427.

wedlii Cobbold, 1860a, 18 (D. pelophylacis esculenti renamed) (in Rana esculenta).—Stoss., 1889, 71.

westermani Kerbert, 1881a, 529–578, pl. 26–27, for westermanii.

westermanii Kerbert, 1878a, 11 Nov., 271–273 (in Kœnigstiger; Amsterdam).—Bettend., 1897a, 7 (westermanni); 1897b, 311 (westermanni).—R. Bl., 1891a, 610–611 (westermanni) (syn. D. ringeri); 1895, 34–39, 188; 1895, 649–932, figs. 47–116.—de Bonis, 1882, 148 (westermanni).—Brand., 1888a, 50 (westermanni); 1890a, 577 (westermanni); 1891d, 7 (westermanni).—Braun, 1892a, 586, 588, 589, 597, 602, 604, 605, 607, 622, 628, 644, 645, 654, 664, 665, 666, 668, 669, 671, 675, 677, 679, 682, 699, 700, 701, 703, 705, 707, 711, 712, 713, 715, 717, 718, 719, 723, 724, 725, 727, 728, 730, 733, 735, 736, 752, 753, 758, 784, 785 (westermanni); 1893a, 876, 882 (westermanni); 1893b, 185 (westermanni); 1895b, 142–143, fig. 58 (westermanni); 1899g, 491, 492 (type of Paragonimus) (westermanni); 1900h, 3, 5, 6 (westermani); 1901c, 329, 330, 332, 333 (westermanni); 1903, 3 ed., 155 (westermani) (to Parag.).—Buttel-Reepen, 1902, 185 (westermani).—Cobbold, 1880l, 139–140, pl. 10, figs. 1–3 (westermanni); 1884g, 976 (westermanni).—de Does, 1903, 409–412 (westermanni); 1905, 278–279 (case in dog) (westermanni).—Dubler, 1892a, 78 (in panther) (westermanni).—Fischer, 1883a, 8, 29 (westermani).—Gamb., 1896a, 63 (syn. of D. pulmonale) (westermanni).—Gronkowski, 1902a, 522 (15) (westermanni).—Huber, 1896a, 576, 577 (syn. of D. pulmonale) (westermanni).—Inouye, 1893a, 79–86; 1897a, 175–178 (2 brain cases); 1903a, 120, 122, 123 (westermanni).—Jackson, 1888, 643 (westermanni).—Juel, 1889, 14, 33, 37 (westermani).—Kath., 1894a, 143 (westermanni).—Katsurada, 1900d, 506–523, figs. 1–3, pl. 14–15, figs. 1–8 (Japan) (westermanni); 1902b, 50–52; 1904, v. 2 (3), 22; 1904f, 148, 157 (occurs in cats and dogs) (westermanni).—Kiyono, Suga & Yamagata, ——, 261, 262, 263.—Lander, 1904a, 10, 16 (westermanni); 1904, April 9, 580.—LeCount, 1904, 580 (eggs).—Linst., 1890f, 178 (westermani).—Looss, 1885b, 6, 7, 10, 14, 15, 16, 17, 26, 27, 36, 37 (westermanni); 1894a, 118, 180, 198 (westermanni); 1899b, 560, 561 (type of Polysarcus) (westermanni); 1905, 84 (to Parag.) (westermani).—MacCallum, 1899, 708 (westermanni).—Mackenzie, 1904a, 1133–1135 (case in Portland, Oreg.); 1904b–c; 1904, May 7, 745, 758, 901; 1904, June 15, 193; 1905, Jan. 10, 790 (case) (westermanni).—Manson, 1901, 541 (syn. of D. ringeri) (westermanni).—Moniez, 1896, 86, 144–152 (westermanni).—Mont., 1888, 18, 24, 32, 33, 36, 39, 54, 56, 64 (westermani); 1893, 1–229, pl. 1–6; 1893, 6, 26, 36, 38, 155 (westermanni).—Poir., 1885, 26, 27, 149 (westert-

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mani).—Pratt, 1898, 361.—Shaw, 1901, 1027 (westermanni).—Simon, 1897, 259 (syn. of D. pulmonale) (westermanni).—Sons., 1895, v. 9, 291–292; 1896, 297, 302 (westermanni); 1896, July, 534–535.—Stiles, 1894i, 57–58, figs. 1–4 to (Mesogonimus); 1894k, 5 pp., 4 figs.; 1894l, 107–110, figs. 1–4 (Ward's case in U. S. A.); 1894m, 756; 1898, 96.—Stiles & Hass., 1898a, 96 (westermanni); 1900a.—Stoss., 1892, 32 (to Mesogonimus) (westermanni).—Taniguchi, 1903, Dec., 100, 102 (westermanni).—Tyson, 1903, 3 ed., 1181 (westermanni).—Ward, 1894, 355–357, 358–360 (westermanni); 1894, 362–364 (westermanni); 1895, Feb., 87–89 (westermanni in U. S. A.); 1895, Mar. 2, 236–239, figs. 1–3 (westermanni); 1895, 304–309 (westermanni); 1895, 238 (man, tiger, cat, dog), 244–246, figs. 4–6 (westermanni); 1895, 328 (in Homo), 341 (in Canis familiaris); 1896, 5 Nov., 709 (westermanni); 1903, 867 (to Parag.).—Weber, 1891, lxxxiii–lxxxiv (tiger, Sumatra) (westermani).—Ziegler, 1883, 544, 556, 557 (westermanni).

westermanni Leuck., 1889, 404, 408, 409, for westermanii.

winogradoffi Jaksch, 1897a, 219 for sibiricum.

xanthosomum Crep., 1846a, 138 (in Colymbus septentrionalis; Germany).—Braun, 1892a, 679, 699; 1893a, 875; 1893, 353; 1893f, 427; 1902b, 7 (to Metorchis), 8, 9.—Cobbold, 1860a, 15.—Dies., 1858e, 355 (in Podiceps minor).—Linst., 1873, 101.—Looss, 1896b, 58.—Stoss., 1892, 187.—Wagener, 1857, 22, figs. 3, 4 (in Pod. mi.).

zschokkei Volz, 1899, 231–234, 237, pl. 20 (in Heterodon platyrhinus).—Braun, 1901, 944; 1902b, 65.—Luehe, 1899, 532, 533; 1900, 561.—Pratt, 1903, 25.

DISTOMACEA Weinland, 1859, 280 (family of Trematodes).—Stiles & Hass., 1898a, 87, 90.

DISTOMATA Zed., 1800a, 163, pl. of Distoma.—Bojanus, 1817b, 275, 276.—Jackson, 1888, 653.—Loomis, 1885, 394.—Wyman, 1851, August, 65–66 (development).

hominis Taylor, 1884, 27 issue, 44–54, figs. 1–5, apparently used as "distomes of man."—Ward, 1895, 246 (syn. of Fasc. hepatica).

DISTOMATIDÆ Gamb., 1896a, 73, family name (Distoma).

[DISTOMATINÆ Senn, 1903 [flagellates].]

DISTOMATOSIS (= any infection with distomes, s. lat.): Anacker, 1885e, 438; 1889a, 22.—d'Avrilly, (1836), 208–212 (pourriture in ruminants).—Benion, 1874a, 632–646.—Bouley, ——, 21–30.—de Does, 1903, 407–409.—Fenger, 1854, 173.—Gerlach, 1854, 289–292 (liver fluke).—Grassi, (1884b); 1885a, 229–234.—Hilgendorf, 1885a, 127–130.—Hurtrel D'Arboval, 1838, 255 (cachexie); 1874a, 224–230, figs. 95–98.—Hurzard & Tessier, 1817a, 14 pp. (bovine).—Jamieson, 1897b, 147–148.—Le Roy de Mericourt, 1870a, 391–400.—Luciano, (1846a).—Mégnin, 1884, 52–55 (ruminants).—Montel, 1906, 258–262 (pulmonary).—Moulé, 1885, 501.—Perroncito, (1874), 35–36, 1 pl.; (1885), v. 28, 83–86.—Rail., 1896, 159.—Raynaud, 1859, v. 33, 488 (ruminants).—Reynal, 1856.—Schell, 1855–56.—Semmer, 1885, 438.—Signol, 1884, 33–34, figs. 16–18.—Velzen, 1891, Jul., 141.—Veterinarian, 1836, v. 9, 227–228; 1880, Aug., 548–549.—Zuendel, 1874, 224–230, figs. 95–98; ?1880, 30.

——, *hepatic:* Anacker, 1885d, 380–382.—Deutsche tierærztl. Wchnschr., Hannover, 1904, Jun. 4, 226.—Gómez, 1879a, Mar. 1, 81–89.—Matsumoto, 1891, 9–12.

——, *diagnosis of:* Cobb, 1904, 658–669 (eggs as quantitative aid); ——, v. 8, 481.—Manson, 1901, 543.—Solowjew, 1904, v. 11 (7), 218; 1906, v. 10, 37.

——, ——, *hepatic:* Brusaferro, 1887c, 296–304.—Garcia, 1884a, 129–135.

——, *etiology of:* Albanese, 1906, v. 55 (25), 597–602 (toxicity of aqueous extract).—Am. Vet. Rev., 1898, xxii, 82 (Hawaiian Islands).—Mégnin, 1881, 105–108 (ruminants); 1881, 182–183.—Reynes, 1869, 30–36 (hepatic).—Schaper, 1890, 17–18; 1890, 1–95, pls. 1–5; 1889, 96 pp., 5 pls. (and pathology; in domesticated animals).—Staiger, 1876.—Veterinarian, 1879, v. 52, Nov., 807–808 (rainfall).

——, *geographic distribution of:* Akanuma, 1892, 22–27 (hepatic, Saitama district); 1894, 6 (Province of Toyama).—Corlette, 1897a, 146–147 (Sydney).—Gaide, 1905, 568–579 (hepatic, Tonkin).—Kermorgant, 1905, Feb. 7, 104 (Tonkin); 1905, Feb. 8, 88; 1905, Apr. 11, 731; 1905, May 20, 463–464; 1906, Jan. 31, 64 (Tonkin).—Monsarrat, 1898a, 82 (Hawaiian Islands).

——, *in various animals:* Bolotoff, 1890a, 695–696 (domesticated).—Delafond, 1854a, *56 pp., figs.* 12–13.—Didry, 1832a, 139–147.—Léger, 1897h, 957–958 (des *pélécypodes*).—Mangin, 1832, 420.—Sauer, 1898, Nov. 8, 421.

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———, IN CATTLE: Aragon, 1896, 451–456, figs. 1a–3a (hepatic).—Bilhuber, (1791a), (and sheep).—Blakeway, 1879a, 260.—Buuck, 1865a, 33–35.—Collyer, 1893a, 347.—Cornil & Petit, 1901a, 178–179; 1901b, 614; 1901c, 375; 1902a, 114–115; 1902b, 117; 1902c, 57–58 (atrophic cirrhosis).—Curtice, (1891b), Jan. 24.—Jæger, 1906, v. 32 (4–5), 456–476, 2 fig. (hepatic); 1906, Aug., 382.—Lucet, 1890b, 548–549 (lungs); 1890c, 549–550 (rate).—Pease, 1895, May, 326–328; ——, 5–8 (and buffaloes; India); ——, 590–594.—Repiquet, 1899, May 31, 271–272, figs. 2–3; 1899, Nov., 816 (abdominal wall).—Veterinarian, 1880, Feb., 115–116; 1881, May, 317–318.—Watson, 1902, Mar., 145–151 (Connaught).

———, *pulmonary in cattle:* Mackh, 1889, 308–309.—Meltzer, 1894, n. 48; 1895, 137.—Morot, 1887, 38–39; 1887, 64–69; 1890, 407–409.—Rail., 1885, Aug., 285–286 (Dist. hep.).—Rivolta, (1868), 9; (1868), 267; (1868), 296–300; 1869, 473; 1869, 73–75.—Tapken, 1891, 241.

———, *bronchial in cattle:* Morot, 1893, 141–144; 1893, 249.

———, *heart, cattle:* Covu, 1898a; 1898, 98.—Muscle, cattle: Willach, 1892, 239.

———, IN DOG (*Canis fam.*): de Jong, 1896a, 1–12, pl. 1, figs. 1–4 (hepatic) (and cat); 1897a, 245–246; ——, 479 (and cat; hepatic).—Kurimoto, 1894a, 45–49.—Zwaardemaker, 1888, Oct. 15, 679; 1890, Feb., 134–140 (and cat); 1890, May, 197–203, figs. 1–2; 1890, Aug., 276–277; 1890, 139–140.

———, IN DEER: Bassi, 1875; 1876, 235.

———, IN HORSE: Adams, 1876, Nov., 764–765 (hepatic).—Galli-Valerio, 1893a, 173–182; 1895c, 266 (gall duct); 1895c, 558.—Willach, 1892, v. 18, 118 (lungs).

———, IN MAN: Cobbold, 1884g, 976;—Florance, 1866a, 36 pp.—Grall, 1887a, 459–470, 4 figs.

———, ———, *hepatic* (see also fascioliasis): Allen, 1881b, 257.—Caraocs, 1888a, 44 pp., 4 figs. (Asia).—Cobbold, 1875i, 423; 1875k, 780–781.

———, ———, *hepatic, Japan* (see also opisthorchiasis): Akanuma, 1892, 22–27.—Aoyama, 1891a, Apr. 5.—Hori, 1890a, Feb. 5.—Inoue, Oaknishi & Katsurada, 1891a.—Kajama & Nanba, 1892a, 32–36.—Katsurada, 1890a, 38–41 (cirrhosis); 1891a, 20–32, 2 figs., 26–41, 2 figs. (Okajamaken); 1892a, 9–32, 28–32, 31–40, 27–32, 27–33, 18–21 (pathology); 1893a, 73–79; 1897a, 11–19, 3 figs. (pathology); 1899c, 38–45, 1–16 (pathology); 1900a, 1–9, 1–10, 1–5 (pathology).—Kurimoto, 1893a, 1–7, 21–24, 35–24, 35–39, 1 pl. (Provinz Saga); 1893b, 67–69, 85–87, 109–111.—Nochezuki & Tsutsumi, 1899a, 13–24.—Otani, 1892, 1–17 (Nagasaki district).—Winoue, 1892, Jun. 20, art. 2.

———, ———, *intestinal:* Ghose, 1869a, 210–211.

———, ———, *pulmonary* (see also paragonimiasis: [Gouveá, 1895a, 46 pp.; 1897a, 308–309, Fasc.]

———, ———, *venal* (see also bilharziosis): Duval, 1842a, 769–772; 1842, 9.

———, ———, *subcutaneous:* Malherbe, 1898, Jan. 22, 49–50, figs. 4–11; 1898, Mar. 12, 476; 1898, Dec. 24, 1289.

———, IN RABBIT (*Lepus*): Rail., 1887, Jul., 324–325.

———, IN SHEEP [nearly all articles on distomatosis in sheep refer to fascioliasis, q. v.] [liver rot, rot, etc.]: Agric. J., Cape Town, 1894, v. 7, 232–233.—Agric. J., Cape Town, 1891, v. 4, 161; 1892, Jan. 14, 160.—Alexander, 1906, Feb. 16, 3–4.—Am. J. Micr., 1880, Jun., 135.—Bass, 1893a.—Bidloo, (1697a).—Boissou, 1878a, 183–189 (Peyrat-le-Château).—Brown, 1861a, 347–379; 1861b, 617–619; 1881a, 326–337; 1886b, 613–615.—Bruce, 1895a, 486–490.—Cobb, 1897a, 453–481, figs. 1–18, 1 pl.; 1897b.—Cobbold, 1880c, 257–258; (1880d), Apr. 7.—Dickens, 1830a, 645–647.—Edin. Vet. Rev., 1863.—Exper. Station Rec., Wash., 1903, Nov., 304.—Fonssagrives, 1868a, 299–315, figs. 1–2.—Halse, 1887a; 1888a, 147–149.—Hamilton, 1880a, 290.—Hamont, 1834a, 537–546, 587–592 (Egypt).—Harrison (1804a).—Hedwig & Reutter (1790a); (1790b), 342.—Hering, 1852a, 117–128.—Hoefnagel & Reeser, 1905, Jun.; 1906, Jan. 1, 50.—Hogo, 1903a, 603.—Hutcheon, 1903n, 603–604; 1905, Jan., 33–48.—Jones, 1894a, 274 (Australia).—J. Comp. M. & S., 1880, Jul., 173.—Joy, 1846a, 297–298.—Karkeek, 1831a, 573.—Kingdon, 1861, Apr., 224–225.—Leeuwenhoek, 1704, 1522–1527; 1705, 1522.—Lessona, (1846a).—Marshall & Hurst, 1887, 25–35.—Moodie, 1903, Jun., 726–727.—Nosotti, 1906, (5); 1906, Jun., 141.—Oekon. Nachr. d. Ges. in Schlesien, ——, B. 1, 242.—Rail., 1890, 422.—Ratz, 1899, 616–618 (in spleen).—Rolleston, 1880, Apr. 14.—Rowe, 1872, Sept. 7; 1873, Feb., 120–128 (in Australia).—Salvagnoli-Marchetti, 1856,

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52–56; 1856, 76 pp.—Samml. v. Natur.- u. Med.-Geschichten, Breslau, 1718a, 694.—Schaeffer, 1753; 1762.—Schiller, 1844, 285–288 (Hungary).—Sheldon, 1881, 107–109 (England).—Simonds, 1861, 274; 1862.—Steel, 1890, 135–172, figs. 29–48.—Stewart, 1900, Oct., 10 pp.—Veterinarian, 1836, v. 9, 539–540; 1863, v. 36, 100; 1863, Mar., 157; 1872, Aug., 542; 1873, Feb., 155–161; 1879, May, 359–360; 1880, Mar., 201–202; 1880, Feb., 136–137; 1880, Jun., 402–403 (Sussex); 1881, Mar., 178–179; 1881, Jan., 29–30; 1882, Nov., 362; 1883, Feb., 130–132.—Wells, 1883, Apr., 171.—Williams, 1895, Dec., 92–93 (Australia).—Zambelli, 1874.—Zuendel, 1880, Apr. 15, 326–336; 1880, 30 pp.

———, MISCELLANEOUS: Harz, 1881c, 1–15, pl. 1 (in Astacus).—Rail., 1887, Aug., 559–560 (pulmonary); 1887, 392.—Vallada, 1882, 35–39 (crayfish and crabs).—Zuendel, 1881, 459–465; 1881, Oct., 833–848, 1 pl., figs. 1–3; 1882, Mar., 196–202, figs. 1–3 (des écrevisses).

———, PATHOLOGY AND LOCATION of: R. Bl., 1901b, 204–212, 218–219; 1901c, 581–589.—Bossuat, 1902, 161–206 (hepatic); 1902, 56 pp.; 1903, Jan. 17, 12; 1903, Feb. 28, 115–116; 1903, Aug. 14, 533–534; 1905, July, 76.—Bonvicini, (1881a), 133–134 (hepatic); 1882a, 114.—Colucci, 1882, 535–568.—Hamont & Fischer, (1834b), 129.—Inoue, 1897b, 1–5; 1898a, 8–32, 25–40, 16–40, 17–28 (Japan); (1899a), 20, 15, 1, 1, 1; 1900b, 1–23 (pulmonary); 1900c, 515, 664, 739.—Inoue & Katsurada, 1891a, 8–12, 1 pl. (hepatic).—Katsurada, 1892.—Macgregor, 1877.—Miura, 1889, 310–317, pl. 7, figs. 1–3.—Morot, 1889, 37 (cattle); 1890, 732–734.—Pastor, 1897; 1900, 617–618 (hepatic).—Perroncito, 1887, Mar. 3, 97–112.—Pilavios, 1894, 407 (lungs, cattle); 1894, 579; 1895, Apr., 133.—Sodero, 1889, Nov. 30, 484–490, figs. 1–2 (hepatic); 1892, 161.—Spengel, (1892), 146–147.—Taniguchi, 1904, 100–121; 1905, July 29, 508–509 (cerebral).—Toichiro, 1883, Feb. 23.—Yamagiwa, 1899; 1890 (cerebral, man).—Zacharias, 1892, Dec. 3, 752–753 (cysts).

———, *mortality from:* Veterinarian, Lond., 1836, Apr., 225–228; 1880, Apr., 246–247; 1880, Sept., 650–664.

———, *symptoms of:* Aitken, 1866, 42; 1872, 207.—Anders, 1903, 6 ed, 1245.—Inoue & Kodama, 1896a, 14–21.—le Ray, 1897a, 372–386.

———, *prevention of:* Agric. J., Cape Town, 1894, Sept. 20, 442.—Bennett, 1876a, 677–680.—Manson, 1901, 543.—Stiles, 1902, pp. 220–222, figs. 197–203; 1905dd, 220–222, figs. 119–128.—Tierarzt, Wetzlar, 1904, May, 99–100.—Veterinarian, 1837, Aug., v. 10, 442–444.

———, *treatment of:* Agric. J., Cape Town, 1898, Aug. 4, 138–139.—Anders, 1903, 6 ed., 1245.—Armatage, 1895, 445–454.—Bekker, 1893, Jan. 26, 23.—Fegliata, (1887a), 61–62.—Khouri, 1904, 80 (rhubarb).—Riomsai, 1883, Sept. 5 (pulmonary); 1884, Feb. 16.—Romagli, 1903, Feb. 25; 1903, May 31, 301 (salol, sheep); 1903, June, 245; 1903, July 1, 513–519; 1904, Jan. 1, 9; 1904, Apr., 89–90.—Tappemer, 1900, 97–105; 1900, Dec. 11, 1729–1731.—Universal Mag., 1838, (1748).—Vallada, 1857; 1859, Aug., 538–595.—Verhandl. ü. Arb. d. Oekon. Patriot. Soc. d. Fürstenth. Schweidnitz u. Janer, 1818, 323.—Veterinarian, 1838, Mar., 112 (salt); 1873, Oct., 698–699.

DISTOMEA Mont. [not Distomea (Protozoa)]. See Braun, 1890a, 516.—Olss., 1893.—Stiles & Hass., 1898a, 87, 90. See also Leuck. (1856), f. name.

DISTOMEÆ Leuck., 1863a, 527 (fam. name).- Brand., 1888a, 49; 1891c, 730.—Braun, 1883a, 38, 58; 1893a, 886.- Jackson, 1888, 644.—Schneidemuehl, 1896, 296.—Stiles & Hass., 1898a, 87, 90.—Tasch., 1879, 234.—Zuern, 1882, 113.

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DISTOMIDA Manson, 1903, 3 ed., 606 (probably for Distomidæ).

DISTOMIDÆ Cobbold, 1860a, 1–56 (synopsis of tribe); 1877f, 326; 1879b, 4.—Brand., 1890a, 576.- Braun, 1883a, 59; 1890a, 515, 538; 1893a, 886, 890, 895, 900, 907; 1895b, 136.—Caullery, 1902, 21–24 (ascidian).- Haswell, 1887a, 286.—Haymann, 1905, 81–100, 1 pl. (from chelonians); 1906, Mar., 178.—[Herdman, 1890, 617 (family of Ascidiæ compositæ)]. Hoyle, 1890, 539 (includes: Dist., Fasc., Bilharzia, Echinost., Amphist., Gastrodiscus, Homalogaster, Gastrothylax, Eurycœlium). Jackson, 1888, 643, 646, 647, 648, 654 (key).—Jacoby, 1899c, 1–30, 2 pls.- Kholodk., 1898, 25.—Klein, v. 22, 59–80, 1 pl. (from Rana); 1906, Mar., 178.—Leuck., 1886d, 30, 90, 442.—Levin., 1881a, 67.—*Looss*, 1899b, 541, 542, 543, 659 (contains Amphistominæ Looss, Fasciolinæ *Looss*) [*not* Distomidæ, ascidian, see Herdman, 1900, 82]; 1900d, 601–608

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(genera, nomenclature); 1901, 191, 196; 1902b, 120; 1902m, 838; 1904i, 21–22.—Maclaren, 1904, 598, 605, 608, 610, 611, 612, 613.—Montgomery, 1906, Feb. 12, 16.—Mont., 1888a, 7, 15, 17, 18, 20, 24, 28, 30, 43, 52, 56, 60, 68, 90, 92, 104 (subf.); 1891, 449, 516; 1892, Oct. 7, 214 (fam. of Malacocotylea); 1893, 153, 154, 155; 1893, 229; 1894, June 2, 872–874; 1894, Nov. 1, 16–21. · Mueh., 1898, 21.—Nickerson, 1902, 610.—Schneidemuehl, 1896, 295, 296.—Stiles, 1905z, 14.—Stiles & Hass., 1898a, 87, 89, 90; 1900a, 558–611, 2 pls., 6 figs.—Stoss., 1898, 22.

DISTOMIDEA Ben.,——.—Carus, 1863, 478.—Mont., 1888a, 84.

DISTOMIDÉS Bl., 1888a, 541, 542, 543 (includes Dist., Amphist., Bilharzia), French name.

DISTOMIDI Mont., 1892, Oct. 7, 191.

DISTOMIDŒ Montgomery, 1906, Feb. 12, 17 (for Distomidæ).

DISTOMII Duj. of E. Bl., 1847, 277 (includes: Distomidæ, Amphistomidæ, Holostomidæ).

DISTOMINÆ Mont., 1892, Oct. 7, 214 (subf.).—Braun, 1893a, 890.—Looss, 1899b, 541.—Mueh., 1898, 21.—Stiles, 1905z, 14.—Stiles & Hass., 1898a, 90.—Stoss., 1898, 22.

DISTOMINEA, see Stiles & Hass., 1898a, 87.

DISTOMOMUM Sons., 1894, 172 (for Distomum).

DISTOMOSE, see distomatosis, Rail., 1896, 159, name of disease.

DISTOMOPSIS Rafinesque, 1815, 151 (new name for Dist. Zed., hence type Fasc. hepatica).

DISTOMULUM Brand., 1892, Oct. 7, 510 (see Agamodist.).—Stiles & Hass., 1898a, 82, 87 (syn. of Agamodist. Stoss., 1892).—Stiles, 1902s, 29; 1904i, 12.

DISTOMUM Dies., 1850a, 141, for Distoma.

DISTOMUS Gærtner, 1774, tunicate.

mamillaris Gærtner in Pallas, 1774, 20, also index.

variolosus Gærtner in Pallas, 1774, 35, 40, pl. 4, fig. 7, tunicate.—Lamarck, 1816, v. 3, 101.

DISTOMUS Lænnec, 1812c, 9–12 (m. intersectus).

intersectus Lænnec, 1812c, 9–12.

DISTONUM Goto, 1891a, 181.—Laspeyres, 1904a, 5, 12 (for Distomum).

DOLICHODEMAS Looss, 1900, 603, 608, Dolichosomum Looss, 1899 (not Dolichosoma Steph.,— —, coleopt.; not Huxley, 1867, saur.) renamed, hence type lorum Duj., 1845); τὸ δεμας, body.

DOLICHOSOMUM Looss, 1899b, Dec., 652–653, 655 [not Dolichosoma Steph., — —, coleop., not Dolichosoma Huxley, 1867, saur.] m. lorum; δολιχός long, τὸ σῶμα body; 1900, 603, 608 (renamed Dolichodemas).—Braun, 1900h, 13; 1901i, 56.—Luehe, 1900, 557.—Ofenheim, 1900, 183.
1899: Dolichost. Looss, 1899b, 551, 652, misprint.

lorum (Duj., 1845a) Looss, 1899b, 653.

DOLICHOSTOMUM Looss, 1899b, Dec., 551, 652, misprint for Dolichosomum.

DYSTOMA Bojanus, 1817b, pl. ix (for Distoma).

amphistomoides Bojanus, 1817b, 270–277, pl. 9, figs. 1–6 (in Castor fiber).

hepaticum (Linn., 1758) Most, 1836, v. 1, 581, see sub Distoma.

krohnii Kœlliker, 1849d, 65 (in cephalopod), see sub Distoma.

ECHINATA (Echinostoma) Rud., 1809a, 415 [the term Echinata is probably not used in a nomenclatural sense].

ECHINELLA Ben. & Hesse, 1864, 93–94 (not Achar., 1803, poly.; not Swains., 1840, mollusk) (m. hirundinis).—Braun, 1890a, 408, 410, 446, 511, 516, 517, 523, 531, 532; 1893a, 890.—Gamb., 1896a, 73.—Mont., 1888a, 86, 88, 98; 1891, 111; 1903, 336 (subf. Udonellinæ).—Pratt, 1900a, 646, 649 (key), 655, fig. 13.

hirudinis Mont., 1888a, 10 (for hirundinis).

hirundinis Ben. & Hesse, 1864, 94, pl. 8, figs. 17–19 (in Trigla hirundo).—Braun, 1890a, 418, 532, 548, 550, 552.—Mont., 1888a, 10 (hirudinis).—Pratt, 1900a, 655, fig. 13, 657.—Tasch., 1878, 573 (to Udonella).

ECHINOSTOMA[a] Rud., 1809a, 37–38, 415 [tld. echinatum].—Baird, 1853a, 55.—Blainv., 1828a, 587–588.—R. Bl., 1891, 609.—Brand., 1892b, 506.—Braun, 1892a, 567, 568, 578, 584, 699, 708, 772, 815; 1893a, 821, 884, 885, 890, 909, 911; 1895b, 121, 138; 1900h, 3; 1901b, 29, 33, 34; 1901e, 315, 328; 1901, 562; 1902b, 26, 117.—Cobbold, 1858b, 162; 1860a, 32; 1864b, 32; 1879b, 461–462.—Dies., 1850a; 1855c; 1858e; 1859c.—Duj., 1845a, 423.—Fil., 1855b, 25; 1857c, 28.—Fuhrmann, 1904, 62.—(Gœze, 1782a).—Hoyle, 1890, 539.—Jackson, 1888, 643, 654.—Kowal., 1897c, 554–565, figs. 1–8 (in chickens and ducks); 1897d, 554–565, figs. 1–8; 1897e, 407–408; 1898e, 412; 1898h, 107.—Kamensky, 1900a, 3.—Leuck., 1863, 456.—Looss, 1894a, 172, 249, 251; 1896b, 120, 138, 142; 1899b, 527, 534, 535, 538, 542, 551, 571, 572, 573, 574–575, 576, 578, 579, 582, 625, 696; 1900d, 603; 1901b, 194, 199, 200, 201, 209; 1901e, 628, 655.—1902m, 455, 457, 781, 786, 804, 816, 817, 830.—Luehe, 1899k, 532; 1900u, 489; 1900aa, 563.—Mont., 1888a, 12, 14, 24, 92, 105; 1892, Oct. 7, 214 (gen. of Distominæ); 1892, 704; 1893, 150, 152, 153, 154, 158, 161.—Moul., 1856a, 15.—Odhn., 1902, 20, 21, 38.—Pratt, 1902a, 888, 895.—Rail., 1900, 242.—Rud., 1809a, 37–38, 415; 1814a; 1819a.—Stiles, 1901, 197.—Stiles & Hass., 1894; 1898a, 87 (type echinatum), 88, 96.—Stoss., 1892, 4, 5, 28; 1898, 52; 1899, in 11–16.

acanthocephalum (Stoss., 1887) Stoss., 1898, 57 (in Belone acus; Triest); 1899, 1,6 (to Tergestia).

acanthoides (Rud., 1819) Cobbold, 1860a, 33.—Braun, 1901e, 315.—Duj., 1845a, 424 (in Phoca vitulina; Berlin).—Looss, 1899, 581.—Stoss., 1892, 29 (in Ph. vit.; Baltic); 1899, 14.

africanum Stiles, 1901k, 594 (E. bursicola Looss, renamed).

anceps (Mol., 1859) Stoss., 1892, 168 (in Fulica atra; Padova); 1899, 13.—Looss, 1899b, 581.

annulatum (Dies., 1850) Cobbold, 1860a, 36 (in Gymnotus electricus; Brazil).—Looss, 1899, 581.—Stoss., 1899, 14.

apiculatum (Rud., 1803) Cobbold, 1860a, 35.—Looss, 1899b, 581, 696.—Stoss., 1892 173 (in Strix flammea L., Greifswald; Syrnium aluco L., Vienna); 1899, 14

armatum Fuhrmann, 1904, 61–63, fig. 3 (in Rostrhamus sociabilis).

asperum (Wright, 1870) Stoss., 1892, 164 (in Botaurus minor; North America); 1899, 13.—Looss, 1899b, 581, 695, 696; 1902m, 817.—Odhn., 1902, 38.

baculus (Dies., 1850) Cobbold, 1860a, 36 (in Mergus albellus); 1860, 31.—Looss, 1899b, 581, 693.—Nicoll, 1906, 154.—Stoss., 1892, 163 (in Mer. alb.; Ratzeburg); 1899, 14.

beleocephalum (Linst., 1873) Stoss., 1892, 169 (in Ardea cinerea L.; Ratzeburg); 1899, 14.—Looss, 1899, 581, 687, 695.

bicoronatum (Stoss., 1883) Par., 1902, 5 (in Corvina nigra, Umbrina cirrhosa; Portoferrajo).

bilobum (Rud., 1819) Cobbold, 1860a, 35.—Looss, 1899, 572, 581, 684–685, 687, fig. 8; 1901b, 201, 209 (with E. ramosum probably represents a subg. of Echinost.).—Odhn., 1902, 38.—Stoss., 1892, 171–172 (in Fulica atra, Plegadis falcinellus; Padova and Vienna; Platalea leucorodia; Venice); 1899, 13.

bursicola Looss, 1899b, 694–696, figs. 19–20 (in Milvus parasiticus at Adeleninsel, Heluan, Apr.; Falco tinnunculus at Dachschur, Jan.).—Braun, 1901, 18; 1902b, 74.—Stiles, 1901s, 593–594 (renamed africanum); 1902cc, 360.

cesticillus (Mol., 1858) Mont., 1893, 158–161, pl. 5, figs. 56–60, pl. 6, fig. 68.—Barbagallo & Drago, 1903, 11 (in Seriola dumerili, Torpedo ocellata, Umbrina cirrhosa; Catania).—Looss, 1894a, 252 (Dist. valdeinflatum as syn.); 1899b, type of Stephanost.—Stoss., 1898, 54 (in Zeus faber, Lophius piscatorius, Corvina nigra, Umbrina cirrhosa; Triest).

cinctum (Rud., 1803) Cobbold, 1860a, 35 (in Vanellus cristatus, V. melanogaster).—Looss, 1899b, 580, 683, 687.—MacCallum, 1904, 547.—Stoss., 1892, 172–173 (in Vanellus cristatus, V. melanogaster, Gallinula chloropus; Rostock); 1896, 126; 1897, 10; 1898, 53; 1899, 12.

cloacinum Braun, 1901d, 259 (D. bursicola Crep., renamed) (in Ardea cinerea); 1902b, 74 (Dist. bursicola Crep., as syn.).—MacCallum, 1904, 547.—Stiles, 1901k, 593–594 (nomenclature); 1902cc, 360.

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[a] Rud. originally proposed Echinostoma as a genus, but in the same work he used it *in such a* way that we must also interpret it as a subgenus. For the original species see *D. (Echinostoma)*.

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columbæ liviæ Mueller, 1897, 26, pl. 3, fig. 7 (in Columba livia).

conoideum (Bloch, 1782) Kowal., 1896, 5; 1897c, 554–565; 1897e, 407–408; 1898h, 111; 1902d, 27 (in Anas boschas dom.; Dublany); 1904, 24 (in Anas boschas dom.; Dublany).—Galli-Valerio, 1898m, 923.—Looss, 1899b, 581.—Rail., 1898, 412.—Stoss., 1899, 13 (in Anas boschas).

coronatum (Rud., 1819) Stoss., 1892, 30–31 (in Didelphys virginiana; Brazil); 1892, 37; 1899, 14.—Braun, 1901c, 319, 320 (to Rhopalias).—Looss, 1899b, 581.

coronatum (Wagener, 1852) Stoss., 1898, 56–57 (in Corvina nigra; Triest).—Type of Anoiktost. 1899.

cristatum (Rud., 1819) Cobbold, 1860a, 37 (in Stromateus fiatola).

croaticum (Stoss., 1889) Stoss., 1892, 165–166 (in Carbo graculus; Fiume); 1899, 12.—Looss, 1899b, 580.—Par., 1902, 1, 4 (in Phalacrocorax graculus; Caproja).

crocodili (Poir., 1886) Stoss., 1895, 227–228 (in Crocodilus siamense); 1899, 12.—Looss, 1899b, 575, 580.—Odhn., 1902, 20.

denticulatum (Rud., 1802) Cobbold, 1860a, 36.—Looss, 1899, 581.—Stoss., 1892, 170–171 (in Sterna cantiaca, Vienna; S. hirundo, Greifswald; Hydrochelidon nigra, Anas sponsa); 1899, 14.

dilatatum (Fischer, 1840) Cobbold, 1860a, 35 (in Phasianus gallus).—Hass., 1896a, 3 (syn. of Echinost. echinatum (Zed.)).—MacCallum, 1904, 547.—Stoss., 1892, 167.

dujardini MacCallum, 1904, 547, for dujardinii.

dujardinii Cobbold, 1860a, 37 (in Pleuronectes maximus, P. platessa); see Dist. hystrix Duj.

echinatum (Zed., 1803) Blainv., 1828a, 588.—Baird, 1853a, 55.—Braun, 1906, 142 (in ducks and geese).—Cobbold, 1860a, 33.—Galli-Valerio, 1898m, 923.—Hass., 1896a, 3 (syns., D. ech., D. oxycephalum, D. dilatatum, D. armatum, Echinost. dilatatum) (in Gallus dom.).—Kowal., 1894, 221; 1896, 257 (in Corvus cornix, Anas crecca); 1898g, 70; 1898h, 111, 113, 115, 116, 117, fig. 27; 1902d, 27 (in Anas boschas dom.; Dublany); 1904, 24 (in Anas boschas dom.; Gallus dom.; Dublany).—Linst., 1893, 333 (larva in Bythinia ventricosa, Physa fontinalis, Valvata macrostoma, Limnæa palustris).—Looss, 1899b, 575, 580, 679–684, 687, 693, figs. 5, 7, 10; 1901b 201, 209; 1902m, 823.—Luehe, 1898, 625; 1901, 175.—MacCallum, 1904, 547, 548.—Much., 1898, 21; 1898, 71 (in Œdemia fusca, Colymbus arcticus, Ciconia alba, Buteo vulgaris).—Nicoll, 1906, 154.—Nord., 1840, 621 (syn. of Fasc. trigonocephala).—Rail., 1898, 412.—Sons., 1897, 252.—Stiles & Hass., 1898a, 88.—Stoss., 1892, 167 (syns. Dist. anatis fuscæ, D. armatum, D. dilatatum, D. ech., D. fuligulæ ferinæ, D. oxycephalum, D. radiatum, Ech. dilatatum, Fasc. anatis); 1896, 127; 1898, 52; 1899, 12.—Wolffhuegel, 1900, 9, 57, 58, 59, 60, 61.—Reported for Anas anser, A. boschas, A. clangula, A. clypeata, A. cygnus, A. ferina, A. fuligula, A. marila, A. moschata, A. nyroca, A. olor, A. penelope, A. strepera, A. tadorna, Anser albifrons, Archibuteo vulgaris, Ardea comata, A. gardeni, A. grus, A. nycticorax, A. pavonia, Balæarica pavonia, Bucephala clangula, Carbo cormoranus, C. pygmæus, Canis familiaris, Chaulelasmus streperus, Ciconia alba, C. nigra, Colymbus arcticus, Coracias garrula, Fuligula cristata, Grus cinerea, Machetes pugnax, Mareca penelope, Pernis apivorus, Podiceps cristatus, P. minor. Larva in: Lymnæus stagnalis, Paludina vivipara, P. achatina, Planorbis corneus.

echiniferum (La Valette, 1855) Stoss., 1892, 171 (in Scolopax gallinago, Mergus merganser, Anas boschas, Podiceps minor); 1899, 14.—Looss., 1899, 581.—Wolffhuegel, 1900, 9, 56.

echinocephalum (Rud., 1819) Cobbold, 1860a, 34–35 (in Falco milvus).—Looss, 1899b, 581, 687, 696.—Stoss., 1892, 173–174 (in Milvus regalis); 1899, 14.

elegans Looss, 1899b, 692–693, fig. 18 (in Phœnicopterus roseus; Ghizeh).

euryporum Looss, 1896b, 144–146, pl. 9, fig. 93 (in Milvus parasiticus; Cairo; also in Ardea cinerea); 1899b, 580, 686–687, 690, 696, fig. 16, 17.—Fuhrmann, 1904, 62.—Stoss., 1899, 12.

fallax (Rud., 1819) Cobbold, 1860a, 37.—Looss, 1902m, 823.—Stoss., 1898, 56 (in Uranoscopus scaber; Triest).

ferox (Rud., 1795) Blainv., 1828a, 588.—Cobbold, 1860a, 35.—Kowal., 1902d, 28.—Looss, 1899, 581, 687; 1902m, 817.—Luehe, 1905, 176.—Much., 1898,

ECHINOSTOMA—Continued.

21, 23, 102–105, fig. 14.—Nord., 1840, 622 (as syn. of Fasc. trigonocephala).—Odhn., 1902, 38 (represents a new [unnamed] genus).—Stiles & Hass., 1898a, 88.—Stoss., 1892, 164–165 (in Botaurus stellaris, Ciconia alba, C. nigra; Padova, Vienna, Greifswald, Rennes); 1899, 13.

flexum (Lint., 1892) Stoss., 1899, 13 (in Œdemia americana).—Looss, 1899b, 581.

fralichii (Kowal., 1894) Kowal, 1894, 222; 1898h, 111, syn. of E. conoideum (Bloch).—Stoss, 1899, 13 (in Anas boschas).

gadorum Ben., 1870, 60 (in Merlangus carbonarius; Belgian coast).—Hoyle, 1890, 539.—MacCallum, 1904a, 547.

garzettæ MacCallum, 1904a, 541–548, 1 fig. (in Garzetta nigripes Temm.; Benakat); 1904, Oct., 532.

hispida of Ben., 1870, pl. 4, fig. 13.—Odhn., 1902, 157 (syn. of Deropristis inflata).

hispidum (Abildg., 1819) Cobbold, 1858b, 171, figs. 47–50; 1879b, 462, fig. 77 (in sturgeon).—Ben., 1870, 23, pl. 4, figs. 12–13.—Mont., 1893, 83.—Odhn., 1902, 155, 156, 159 (type of Deropristis), 157 (fig. 13 of Ben., 1870=D. inflata).—Stoss., 1898, 57–58 (in Acipenser sturio; Triest); 1899, 14.

imbutiforme (Mol., 1859) Stoss., 1898, 55–56 (in Labrax lupus; Triest).

incrassatum (Dies., 1850) Cobbold, 1860a, 33 (in Lutra solitaria; Brazil).—Braun, 1901e, 317, 328, pl. 19, figs. 5, 8, 9.—Fuhrmann, 1904, 64.—Looss, 1899, 581.—Stoss., 1892, 30 (in Lutra solitaria; Brazil); 1899, 14.

inerme Fuhrmann, 1904, 63–64, fig. 4 (in Lutra).

inflatum (Mol., 1859) Stoss., 1898, 58 (in Anguilla vulgaris; Triest).

labracis (Duj., 1845) Ben., 1870, 45.—MacCallum, 1904a, 547.

laticolle (Rud., 1819) Par., 1899, 5 (in Trachurus trachurus; Rimini, Naples); 1902, 4 (in Corvina nigra; Seriola dumerili; Elba).—To Tergestia in 1899.

leptosomum (Crep., 1829) Cobbold, 1860a, 35 (in Tringa variabilis, Chalidris arenaria).—Looss, 1899b, 580.—Nicoll, 1906, 517.—Stoss., 1892, 169; 1899, 12.

lidiæ Par., 1902, 6, for lydiæ (in Orthagoriscus mola; Tonnara d'Enfola).

liliputanum Looss, 1896b, 141–143, pl. 9, figs. 91–92 (in Pernis apivorus at Alexandria, Egypt; Milvus parasiticus at Matarijeh); 1899b, 575, 580, 696; 1901b, 200, 201, 202, 209; 1902m, 816, 817 (form from cat represents a new genus), 818.—Stoss., 1899, 12.

lydiæ Stoss., 1896, 190–191, pl. 8, fig. 1 (in Orthagoriscus mola; Triest); 1898, 55.—Barbagallo & Drago, 1903, 411 (in O. m.; Catania).—Looss, 1901e, 605, type of Dihemistephanus.—Par., 1902, 6 (lidiæ) (in O. m.; Tonnara d'Enfola).

magniovatum Stoss., 1898, 53–54 (in Puffinus kuhlii; Triest); 1899, 13.—Looss, 1899b, 581; 1901b, 209; 1901e, 596.

militare (Rud., 1803) Cobbold, 1860a, 34; 1879b, 436, 437.—Kowal., 1902d, 28.—Looss, 1899b, 581.—Stoss., 1892, 163–164 (in Numenius arquatus, Scolopax gallinula, S. gallinago, Ortygometra porzana); 1899, 13.—Also reported for Limnocryptes gallinula.

mordax Looss, 1899b, 688, 690, fig. 9 (in Pelecanus onocrotalus; Egypt).—Kowal., 1904, 19 (in Podiceps auritus; Dublany).

nephrocephalum (Dies., 1850) Cobbold, 1860a, 36 (in Turdus saxatilis).—Looss, 1899b, 581.—Stoss., 1892, 174; 1899, 14 (in T. sax.).

nigroflavum (Rud., 1819) Barbagallo & Drago, 1903, 410 (in Orthagoriscus mola; Catania).

oxycephalum (Rud., 1819) Rail., 1896, 160.

pendulum Looss, 1899b, 580, 688–692, 693, 697, figs. 13, 15b, c (in Recurvirostra avocetta; Adeleninsel, Egypt, Feb.).—Fuhrmann, 1904, 62.

perlatum (Rud., [=Nord., 1832]) Barbagallo & Drago, 1903, 410–411 (in Tinca vulgaris; Catania).

phœnicopteri Luehe, 1898g, 625 (in Flamingo; Berberei); 1899e, 235.—Looss, 1899b, 580, 693 (in Phœnicopterus ruber).—Stoss., 1899, 12 (Barbary).

pristis (Deslongchamps, 1824) Cobbold, 1860a, 36 (in Merlangus communis).—Looss, 1899, to Stephanost.—Stoss., 1898, 54–55 (in Gadus euxinus; Triest).

pseudocchinatum (Olss., 1876) Stoss., 1892, 166 (in Larus marinus; Scandinavia); 1899, 13.—Kowal., 1902d, 27.—Looss, 1899b, 581, 685–686, 690, 691, 692, figs. 11, 12, 15.—Much., 1898, 21–22.—Also reported for Larus fuscus.

ECHINOSTOMA—Continued.

pungens (Linst., 1893) Stoss., 1899, 14 (in Podiceps minor).—Looss, 1899b, 581.—MacCallum, 1904a, 547.

ramosum Sons., 1895, 123–124 (in Babulcus ibis; Nile Delta).—Looss, 1899, 581; 1901, 201.—MacCallum, 1904a, 547.—Odhn., 1902, 38.

recurvatum (Linst., 1873) Stoss., 1892, 162–163 (in Fulix marila; Ratzeburg); 1899, 12.—Looss, 1899b, 580, 693.—Kowal., 1894, 220; 1902d, 27; 1904, 24 (in Anas boschas dom., Gallus dom.; Dublany).—MacCallum, 1904a, 547.—Rail., 1898, 412.—Also in Fuligula marila.

revolutum (Frœlich, 1802) Looss, 1899, 680.

scabrum (Mueller, 1788) Cobbold, 1860a, 37 (in Lota molva, Gadus morrhua).

secundum Nicoll, 1906, 514, 515–518, pl. 12, figs. 1–3 (in Hæmatopus ostralegus, Larus argentatus, L. ridibundus).

serratum (Dies., 1850) Cobbold, 1860a, 35 (in Anas scolopaceus; Brazil).—Looss, 1899b, 581.—Stoss., 1892, 171; 1899, 14.

spathulatum (Rud., 1819) Kowal., 1898g, 69–71, 76, figs. 1–14, 37 (in Botaurus minutus by Bremser); 1898h, 106–121, 158, figs. 1–14, 37 (in Botaurus minutus; Dublany) (spatulatum).—Looss, 1899b, 575, 581.—Stoss., 1899, 13.

spatulatum (Rud., 1819) Kowal., 1898h, 106–121, 158. See also spathulatum.

spiculator (Duj., 1845) Cobbold, 1860a, 33.—Looss, 1899b, 581.—Stoss., 1892, 28 (in Mus decumanus; Hameln, Rennes); 1899, 13.

spinulosum (Rud., 1809) Cobbold, 1858b, 165, pl. 33, figs. 68–72 (in Larus glaucus); 1860a, 36 (in Colymbus septentrionalis, Podiceps cristatus, Anas querquedula, Uria grylle, Carbo graculus, Larus argentatus, L. capistranus, L. glaucus, L. ridibundus, Anas clangula, Numenius arcuatus); 1879b, 448.—Cohn, 1903, 41 (in Alca torda).—Condorelli, 1897, in 118–124 (in Hydrocolœus minutus).—Gilbert, 1905, v. 39, 925–927, 1 fig.—Looss, 1896b, 141; 1899b, 580, 687, 689, 690, 691.—Mueh., 1898, 22.—Nicoll, 1906, 154; 1906, 516, 517.—Par., 1899, 5; 1902, 4 (in Fulica atra; Elba).—Stoss., 1892, 169–170 (in Querquedula circia, Phalacrocorax graculus, Larus argentatus, L. capistranus, Uria grylle, Totanus fuscus, Numenius arquatus); 1896, 127 (in Numenius tenuirostris; Monfalcone); 1898, 52–53 (in Larus ridibundus, Numenius tenuirostris, Podiceps cristatus; Triest); 1899, 12.—Wolffhuegel, 1900, 9, 56 (in Machetes pugnax), 62.—Also reported for Bucephala clangula, Chroocephalus minutus, Fulica atra, Larus fuscus.

tabulatum Mueller, 1897, 21–22, pl. 3, fig. 5 (in Numenius arquatus).—MacCallum, 1904a, 547.

trigonocephalum (Rud., 1802) Cobbold, 1860a, 33.—Kowal., 1902d, 27; 1904, 25 (in Putorius fœtidus; Dublany).—Looss, 1899b, 581; 1902m, 823.—Mueh., 1898, 22.—Stoss., 1892, 29–30 (syns. Fasc. putorii, F. trig., Dist. trig.) (in Erinaceus europæus at Padova, Vienna; Meles taxus at Warnemünde; Mustela foina; Lutra vulgaris; Putorius lutreola; P. communis at Padova, Vienna; Putorius vulgaris at Venezia, Greifswald; Vulpes vulgaris); 1899, 13.

umbonatum Odhn., 1902, 21–22 (in Krokodil; Nile).

uncinatum (Zed., 1803) Cobbold, 1860a, 35 (in Gallinula chloropus).—MacCallum, 1904a, 547.—Stoss., 1892, 172 (=E. cinctum) (in Vanellus cristatus, V. melanogaster, Gallinula chlor.; Rostock).

(ECHINOSTOMA) Rud., 1809a, 37–38, 415–429 (tld. echinatum); a. subg. of Dist. See also Echinost.

acanthoides Rud., 1819a, 114, 415–416 (in Phoca vitulina; Berlin). See Echinostoma.

annulatum (Dies., 1850) Stoss., 1886, 63. See Echinost.

apiculatum (Rud., 1803) Rud., 1809a, 423. See Echinost.

areolatum (Rud., 1809) Stoss., 1886, 60.

bicoronatum (Stoss., 1883) Stoss., 1886, 58.

bilobum Rud., 1819a, 114, 416 (in Tantalus falcinellus). See Echinost.

campanula (Duj., 1845) Stoss., 1886, 62.

cesticillus (Mol., 1858) Stoss., 1886, 57. See Echinost.

cinctum (Rud., 1803) Rud., 1809a, 422–423. See Echinost.

contortum Rud., 1819a, 118 (in Orthagoriscus mola; Naples).

(ECHINOSTOMA)—Continued.

coronarium (Cobbold, 1861) —— ? ——, 1896.

coronatum Rud., 1819a, 686 (in Didelphis virginiana). See Echinost.

coronatum (Wagener, 1852) Stoss., 1886, 58. See Echinost.

corvinæ (Stoss., 1886) Stoss., 1886, 58.

cristatum Rud., 1819a, 117 (in Stromteus fiatola; Arimini). See Echinost.

denticulatum (Rud., 1802) Rud., 1809a, 424–425. See Echinost.

echinatum (Zed., 1803) Rud., 1809a, 418–420. See Echinost.

echinocephalum Rud., 1819a, 115 (includes D. milvi.) (in Falco milvus). See Echinost.

elipticum Stoss., 1886, 64, for ellipticum (Mol., 1858).

exasperatum Rud., 1819a, 117 (in Sorex eremita).

fallax Rud., 1819a, 117 (in Uranoscopus scaber; Naples). See Echinost.

ferox (Rud., 1795) Rud., 1809a, 426–427. See Echinost.

hemicyclum (Mol., 1859) Stoss., 1886, 60.

hispidum (Abildg., 1819) Rud., 1819a, 118, in Accipenser sturio; Arimini, Berlin; includes D. sturionis. See Echinost.

hystrix Duj., 1845a, 433 (in Pleuronectes maximus, P. platessa).

imbutiforme (Mol., 1859) Stoss., 1886, 59. See Echinost.

incrassatum (Dies., 1850) Stoss., 1892, 30. See Echinost.

increscens (Olss., 1868) Stoss., 1886, 58.

inflatum (Mol., 1859) Stoss., 1886, 63. See Echinost.

labracis (Duj., 1845) Ben., 1870, 1871a, 24 (in Labrax lupus; Belgium). See Echinost.

laticolle Rud., 1819a, 117 (in Caranx trachurus; Naples and Arimini). See Echinost.

leptosomum (Crep., 1829) Duj., 1845a, 428. See Echinost.

lima Rud., 1809a, 427–429.

militare (Rud., 1803) Rud., 1809a, 421–422. See Echinost.

mulli (Stoss., 1883) Stoss., 1886, 59.

nigroflavum Rud., 1819a, 118 (in Orthagoriscus mola; Naples).

oculatum (Levin., 1881) Stoss., 1886, 58.

perlatum (Nord., 1832) Stoss., 1886, 62. [Type of Asymphylodora.]

planicolle Rud., 1819a, 686 (in Pelecanus sula; Brazil).

polonii (Mol., 1859) Stoss., 1886, 58.

pristis (Deslongchamps, 1824) Duj., 1845a, 433. See Echinost.

rachion (Cobbold, 1858) Stoss., 1886, 61.

radiatum Duj., 1845a, 385, 427–428 (in Carbo cormoranus or Pelecanus carbo).

radula Duj., 1845a, 433–434 (in Lymnæus palustris; Rennes).

scabrum (Mueller, 1784) Rud., 1819a, 118. See Echinost.

semiarmatum (Mol., 1858) Stoss., 1886, 64.

sobrinum (Levin., 1881) Stoss., 1886, 58.

sophiæ (Stoss., 1886) Stoss., 1886, 59.

spathulatum (Rud. [Crep., 1837]) Par., 1902, 4 (in Ardetta minuta; Portoferrajo).

spiculator Duj., 1845a, 424–425 (in Mus decumanus; Rennes). See Echinost.

spinulosum Rud., 1809a, 425 (in Larus nævius, L. cinerarius and Colymbus septemtrionalis). See Echinost.

trigonocephalum (Rud., 1802) Rud., 1809a, 415–418. See Echinost.

uncinatum (Zed., 1803) Rud., 1809a, 420–421. See Echinost.

valideinflatum (Stoss., 1883) Stoss., 1886, 58.

viriparum (Olss., 1868) Stoss., 1886, 60.

ECHINOSTOMIDÆ Looss, 1902m, 817.

HINOSTOMINÆ Looss, 1899b, 543, 579; 1902, 839.—Braun, 1901.—Nicoll, 1907, 80.—Pratt, 1902a, 888 (includes: Echinost., Stephanochasmus, Dihemistephanus, Stephanoprora; related genus Rhopalias), 895 (key).

ECHINOSTOMUM. See Echinostoma.

EMISTOMUM Sons., 1889, 192, apparently for Hemistomum.

alatum (Gœze, 1782) Sons., 1889, 192.

EMOLEPTALEA Looss, 1900d, 602, Leptalea Looss, 1899 [nec Klug, 1839] renamed, hence type exilis.—Pratt, 1902a, 889, 901 (key).

ENCHELYS Mueller, 1786.—Nitzsch, 1827, 68 (contains Cerc. podura, C.viridis).—[Not Enchelys for Echelus Raf., 1810, fish.]

ENCOTYILLABIDÆ Mont., 1888, 108 (for Encotyllabidæ).

ENCOTYLABE Gamb., 1896a, 73 (for Encotyllabe).

ENCOTYLLABE Dies., 1850a, 290, 427–428 (m. nordmanni); 1858e, 313, 364.—Ben. & Hesse, 1864, 66, 79–81.—Braun, 1890a, 412, 415, 469, 477, 498, 511, 515, 516, 519, 523, 525, 526, 529; 1893a, 889.—Carus, 1863, 477.—Gamb., 1896a, 73 (Encotylabe).—Goldb., 1855a, 20.—Massa, 1906, 43, 48.—Mont., 1888a, 7, 10, 13, 16, 66 (Encotyllahe), 86, 87, 97; 1891, 122; 1892, Oct. 7, 213 (gen. of Encotyllabinæ); 1899, 98, 99; 1903, 335 (subf. Encotyllabinæ; fam. Tristomidæ).—Pratt, 1900, 646, 649 (key), 655, fig. 11.—Tasch., 1878, 566 (syn. of Trist. Cuv.).

1888: Encotyllahe Mont., 1888a, 66 (for Encotyllabe).

1896: Encotylabe Gamb., 1896a, 73 (for Encotyllabe).

nordmanni Dies., 1850a, 428 (syn. Trist. excavatum Nord. MS.) (in Brama mediterranea); v. 14, 70, pl. 1, figs. 1–14; 1858e, 364 (in Br. rayi).—Braun, 1890a, 418, 530, 547, 550 (normanni).—Kroyer, 1838-40a, 595 (in Br. rayi Bl.).—Mont., 1891, 122.—Pratt, 1900, 655, 657, fig. 11.—Tasch., 1878, 564, 565, 568 (to Trist.).

normanni Braun, 1890a, 550 (for nordmanni).

pagelli Ben. & Hesse, 1864, 80–81, pl. 7, figs. 1–11 (in Pagellus centrodonotus).—Braun, 1890a, 411, 418, 419, 530, 547, 551.—Cunningham, 1887a, 278.—Gamb., 1896a, 58, fig. 25A.—Mont., 1888a, 7, 15, 66; 1891, 122.—Tasch., 1878, 569 (to Trist.).

species Par. & Perugia, 1890, 6 (in Crenilabrus pavo).—Braun, 1890a, 530, 547, 550.

ENCOTYLLABIDÆ Mont., 1888, 87, 88, 97, 108 (Encotyllabidæ); 1891, 108, 122.—Braun, 1890a, 517.

ENCOTYLLABINÆ Mont., 1892, Oct. 7, 213 (subf. of Tristomidæ); 1903, 335 (fam. Tristomidæ).—Braun, 1893a, 889.—Pratt, 1900, 646 (Encotyllabe), 649 (key).

ENCOTYLLAHE Mont., 1888, 166, misprint for Encotyllabe.

ENODIA Looss, 1899b, 592–593, 633, 710 (m. megachondrus); ἐνόδιος, am Wege; [not Enodia Huebn., 1816, lepidopteron; not Enodia Dahlb., 1843, hymenopteron; not Enodius, Lap., 1836, coleopteron]; 1900, 602 (renamed Enodiotrema Looss, 1900); 1902, 515.—Braun, 1901a, 23; 1901b, 23.—Stiles, 1901r, 189.

megachondrus Looss, 1899b, 593, 709–710, fig. 30, in Testudo (græca?); 1902, 508 (to Enodiotrema).—Braun, 1901a, 23, 24.—Luehe, 1900, 561.

ENODIOTREMA Looss, 1900, Dec. 3, 602, Enodia Looss, 1899 [nec Huebn., 1816], renamed, hence type megachondrus; 1901l, 562, 563; 1902m, 508, 512, 514, 515, 516, 584, 788, 824, 838.—Braun, 1901a, 23; 1901b, 26.—Cohn, 1902, 882.—Heymann, 1905, 93.—Odhn., 1902, 38, 40, 41, 42, 153.—Pratt, 1902a, 888 (related to Plagiorchiinæ), 900 (key).

acariæum Looss, 1902m, 415, 417, 517–519, pl. 24, figs. 50–54 (in Thalassochelys corticata; Egyptian coast), 873, pl. 24, figs. 50–54.

instar Looss, 1901l, 562, 563 (in Thalassochelys corticata); 1902m, 516–517, 873, pl. 24, figs. 45–46.—Braun, 1902b, 24, fig. 9.

megachondrum (Looss, 1899) Braun, 1901b, 23, 24, fig. 9 (for megachondrus) includes "Monost. cacouanæ Kollar," in Thalassochelys caouana=T. caretta.

megachondrus (Looss, 1899) Looss, 1901l, 561–562, 563 (in Chelone mydas, Thalassochelys corticata; Egypt); 1902m, 414, 415, 417, 508–516, pl. 24, figs. 41–44, 517, 788, 872, pl. 24, figs. 41–44.—Odhn., 1902, 153.

reductum Looss, 1901l, 562–563 (in Thalassochelys corticata); 1902m, 517, 518, 519, 873, pl. 24, figs. 47–49.

ENTOBDELLA Audouin, 1828a, 455, "Il paraît que Blainv. a désigné ce genre sous le nom d'Entobdelle."—Braun, 1890a, 518.—Johnston, 1865, 30, 32.

hippoglossi (Mueller, 1776) Johnston, 1856, 32 (syns. Hirudo hip. Mueller, Phylline hip. Lam., Trist. hamatum), on Hippoglossus vulg.

EPIBATHRA Looss, 1902m, 576, 577, 581, 582, 584, 589, 594, 597, **600, 601, 602, 603,** 609, 612, 614–615, diagnosis (m. crassa).

crassa (Looss, 1901) Looss, 1902m, 414, 416, 557, 575–578, 615, 876, pl. 26, figs. 83–88, 888, pl. 32, figs. 179–180.

EPIBDELLA Blainv., 1828a, 567 (m. hippoglossi).—Ben., 1858a, **1861a, 11, 18–21,** 61, 167, 168, 169, 170, 176, 190, 194.—Ben. & Hesse, 1864, 64, 66, 68–70.—**Brand.,** 1894a, 308.—Braun, 1890a, 412, 414, 415, 423, 429, 451, 453, 465, 466, **469,** 473, 484, 490, 495, 511, 515, 516, 517, 518, 519, 522, 523, 526, 527; 1890e, 597; 1891d, 422; 1893a, 889.—Carus, 1863, 477.—Dies., 1850a, 426 (syn. Phylline Oken).—Fraip., 1880c, 416, 445; 1881b, 28.—Gamb., 1896a, 73.—Goto, 1893a, 798.—Haswell, 1892a, 458.—Jackson, 1888, 646 (excretory system), 647 (rep. syst.), 648.—Johnston, 1865a, 32.—Kroyer, 1843–45a, 404 (in Hippoglossus maximus Mind.).—Lint., 1901a, in 267–304, 11 pls.—Maclaren, 1904, 593.—Massa, 1906, 43, 48, 49.—Mont., 1888a, 10, 11, 13, 16, 19, 28, 35, 36, 42, 52 (Epihdella), 55, 57, 66, 84, 86, 87, 97; 1891, 100, 104, 105, 106, 107, 111, 114, 115, 116, 117, 118, 120, 124, 125 (Epidella), 130; 1892, Oct. 7, 172, 186, 187, 213 (gen. of Tristominæ) (syn. Phyllonella); 1893, 8, 210; 1899, 92, 96, 98, 100, 101; 1902b, 137–145, figs. 1–4; 1902c, July 1, 401; 1903, 335 [= Phyllonella] (subf. Ancyrocotylinæ) (f. Tristomidæ); 1905, 75.—Pratt, 1900a, 646, 648 (key) (on skin of marine fishes), 658.—Scott, 1901, 142; 1905, 117 (Epidella).—St.-Remy, 1898, 532.—Tasch., 1878, 566 (syn. of Trist. Cuv.).

1891: Epidella Mont., 1891, 125 (for Epibdella).—Scott, 1905, 117.

1888: Epihdella Mont., 1888, 52 (for Epibdella).

bumpusii Lint., 1900a, 267, 269, 275, 286–287, pl. 34, figs. 11–15 (in Dasyatis centrura; Woods Hole, Mass.); 1901, 414, 433, 461.—Heath, 1902, 112.—Mont., 1902, 137, 138, 140, 141, 142, 143, 145.—Pratt, 1900a, 655, fig. 5, 657, 658 (key).

diadema Mont., 1902, v. 15, 137–145, figs. 1–4 (in Trygon violacea), 143 to (Phylline); 1902, July 1, 401; 1905, 75.

hendorffii (Linst., 1889) Goto, 1894, 233 (in Coryphæna hippurus).—**Braun, 1890a,** 418, 429, 437, 441, 444, 453, 460, 469, 470, 472, 473, 474, 490, 527, 547, 550.—Heath, 1902, 112 to (Phylline).—Linst., 1904, 678.—Mont., 1891, 101, 105, 107, 108, 115, 119, 120, 125, 126, 130, pl. 5, fig. 8, pl. 6, fig. 22; 1892, Oct. 7, 172 (hendorfii); 1893, 49; 1902, 137, 138, 142, 143, 144 (hendorfi).

hendorfi Mont., 1902, 144 (for hendorffii).

hendorfii Mont., 1892, Oct. 7, 172 (for hendorffii).

hippoglossi (Mueller, 1776) Blainv., 1828a, 567.—Ben., 1858a, 1861a, 21–23, 36–37, 167, 195, pl. 2, figs. 1–10, pl. 3, figs. 1–8 (includes Tertia pediculorum sp. Baster; Trist. hamatum Rathke) (in Pleuronectes hippoglossus).—Ben. & Hesse, 1864, 69 (in Hippoglossus vulgaris).—Braun, 1889k, 621; 1890a, 411, 419, 423, 438, 441, 444, 445, 453, 458, 475, 483, 488, 519, 527, 547, 551; 1890e, 597.—Dies., 1850a, 427 (to Phylline); 1859c, 437 (to Phylline).—Gamb., 1896a, 55, fig. 22c.—Heath, 1902, 111.—Linst., 1901, 280.—Massa, 1906, 49.—Mont., 1888a, 13, 19, 53 (hippoglossus), 87; 1891, 105, 106, 107, 111, 114, 115, 116, 118, 119, 120, 125, 126, 130, pl. 5, figs. 5, 6, pl. 6, figs. 24, 25; 1892, Oct. 7, 172; 1899, 96; 1902, 137, 138, 140, 141, 142, 143, 144, 145; 1905, 75.—Odhn., 1905, 370–372 (syn. Trist. hamatum).—Par., 1896, 1 (in Hippog. vulg.; North Sea.)—Schoett, 1896, 253–265, 1 pl.—Scott, 1901, 142 (in Halibut; Scotland); 1905, 117 (Epidella).—Staff., 1904, May 3, 482 (on Hippog. hippoglossus; Canada).—St.-Remy, 1898, 532.—Tasch., 1878, 568 (to Trist.).—Also reported for Hippoglossus maximus.

hippoglossi var. *pleuronectes* Mont., 1889, 117 (MS. name in Leuck. Coll., renamed Trist. uncinatum).

hippoglossii Ben., 1858a, 1861a, 21 (for hippoglossi).

hippoglossus Mont., 1888, 53, for hippoglossi.

ishikawæ Goto, 1894a, 234–235, pl. 26, figs. 1–3 (on Lethrinus; **Hagi, Japan,** August).—Mont., 1899, 96; 1902, 137, 142, 143.—St.-Remy, 1898, 532–533 (ishikawai).

ishikawai St.-Remy, 1898, 532–533, for ishikawæ.

monticelli Mont., 1902, 143 for monticellii.

monticellii (Par. & Per., 1895) Par., 1896, 1 (in Mugil auratus; **Italy) to (Phylline).**—Mont., 1902, 137, 142, 143 (monticelli).—St.-Remy, 1898, **533–534.**

ovata Goto, 1894a, 234–237, pl. 26, figs. 4–8 (in Anthias schegelii; **Misaki, Japan,** *August*).—Mont., 1899, 96; 1902, 137, 142, 143.—St.-Remy, **1898, 533.**

EPIBDELLA—Continued.

producta Linst., 1903, 354–356, figs. 5–6 (in Solea vulgaris).—Odhn., 1906, 65–66 (syn. of E. soleæ).

sciænæ Ben., 1856, 502–508, 1 pl., figs. 1–4 (on Sciæna aquila; Italy); 1858a, 1861a, 23–37, 195 (in Sc. aq.).—Ben. & Hesse, 1864, 69–70 (E. sciœnæ, syn. of Benedenia elegans).—Braun, 1890a, 411, 419, 518, 527, 547, 552.—Fraip., 1880c, 442 (scienæ).—Goto, 1894a, 233; 1899, 269–270, pl. 20, figs. 8–9.—Massa, 1906, 49.—Mont., 1888, 13, 87; 1891, 105, 107, 120, 125, 126, pl. 6, fig. 23; 1893, 4; 1902, 137, 141, 142, 143, 144, 145; 1905, 75.—Par., 1896, 1 (in Sc. aq.; Italy).—Sons., 1891, 263.—Tasch., 1878, 564, 565 (to Trist.).

scienæ Fraip., 1880c, 442 (for sciænæ).

sciœnæ Ben. & Hesse, 1864a, 69–70 (for sciænæ, syn. Benedenia elegans).

soleæ (Ben. & Hesse, 1863) Mont., 1890, 419; 1891, 105, 106, 107, 109, 111, 115, 116, 118, 119, 120, 124, 125, 126, 130, pl. 5, fig. 7, pl. 6, figs. 26–30; 1892, Oct. 7, 172; 1902, 137, 138, 139, 140, 142, 143, 144, 145.—Linst., 1903, 356.—Odhn., 1906, 65–66 (syn. E. producta).—Par., 1896, 1 (in Solea vulgaris; France), to (Phyllonella).

squamula Heath, 1902a, 109–136, pls., 15, 16, figs. 1–19 (in Paralichthys californicus); 1902b, 843.—Massa, 1906, 49.—Mont., 1905, 75–76, to (Phylline).—Odhn., 1905, 371.

EPIDELLA Mont., 1891, 125, for Epibdella q. v.

hippoglossi (Mueller, 1776) Scott. 1905, 117.

EPIHDELLA Mont., 1888, 52, for Epibdella q. v.

ERPOCOTYLE Ben. & Hesse, 1863, 87; 1864a, 87 (n. lævis).—Braun, 1890a, 413, 415, 416, 511, 516, 517, 523, 538, 539, 546; 1893a, 890.—Gamb., 1896a, 73.—Hoyle, 1890, 539 (one species from gills of Mustelus lævis).—Mont., 1888a, 8, 11, 13, 86, 89, 100; 1892, Oct. 7, 213 (gen. of Polystominæ); 1903, 336 (subf. Diaphorocotylinæ).—Pratt, 1900a, 646, 651 (key, "on gills of Mustelus"), 656, fig. 24.—Tasch., 1879, 253–254, 255; 1879, 69.

circularis Linst., 1904, 493–494, figs. 18–20 or 1904, 17–18, figs. 1–3 (in Acipenser ruthenus).

lævis Ben. & Hesse, 1863, 1864a, 87–89, pl. 7 bis, figs. 1–9 (in Mustelus lævis).—Braun, 1890a, 414, 418, 539, 548, 551.—Linst., 1903, 280.—Mont., 1888a, 8, 13.—Pratt, 1900a, 656, fig. 24, 657.—Tasch., 1879, 254 (in Must. læv.).

ERTOPDELLA Rathke, 1843, 238 (for Entobdella?).

ETEROCOTYLEA Mont., 1899, 81, 88, 107 (for Heterocotylea).

EUBUCEPHALUS Dies., 1855a, 395 (n. Bucephalus polymorphus), subg. of Bucephalus.

(EUCERCARIA) Dies., 1855a, 385–388 subg. of Cercaria; 1858d, 246 (renamed Acanthocephala).

brachyura (Dies., 1850) Dies., 1855a, 386; 1858d, 257.

brunnea (Dies., 1850) Dies., 1855a, 387; 1858d, 247.—See Dist. echinatum, type of Echinost.

chlorotica (Dies., 1850) Dies., 1855a, 386; 1858d, 253.

fallax (Dies., 1850 pars) Dies., 1855a, 387–388; 1858d, 248.

minuta (Nitzsch, 1817) Dies., 1855a, 385.

neglecta (Fil., 1854) Dies., 1855a, 386–387; 1858d, 246.

vesiculosa (Dies., 1850) Dies., 1855a, 385; 1858d, 254.

virgula (Fil., 1837) Dies., 1855a, 386; 1858d, 260.

EUCOTYLE Cohn, 1904, 238 (n. nephritica).

nephritica (Mehlis, 1846) Cohn, 1904, 237–238, fig. 4.

EUMEGACETES Looss, 1900, Dec. 3, 602, Megacetes Looss, 1899 [nec Thomas, 1859], renamed, hence type "triangularis" of Looss =emendatus Braun.—Braun, 1901f, 568; 1902b, 53, 92, 93, 94, 95, 96.—Pratt, 1902a, 889 (related to Dicrocœliinæ), 904 (key).

contribulans Braun, 1901f, Apr. 25, 568 (in Hirundo rustica); 1901g, 895, 943; 1902b, 54, 93, 95, 96, fig. 54.—Poche, 1907, 126 (syn. of crassus).

crassus (Sieb., 1836) Poche, 1907, 126.

EUMEGACETES—Continued.

emendatus Braun, 1901f, 568, new name for Dist. meropis of Par. =Megacetes triangularis of Looss, not D. triangulare Dies.; also in Caprimulgus europæus; 1901g, 895; 1902b, 54, 93, 94, 97.—Looss, 1902m, 819, 823.

medioximus Braun, 1901g, 895–896 (in Galbula grandis Lath; Brazil); 1902b, 96, figs. 55, 56.

[*triangularis* of Looss, see emendatus.]

EUPOLYCOTYLEA Dies., 1850a, 289, 416 (subtribe of Polycotylea).—Braun, 1890a, 515.—Cerf., 1899a, 351.—Goldb., 1855, 18.

EURYCŒLIUM Hoyle, 1890, 539, for Euryccelum.

EURYCŒLUM Brock, 1886a, 543–547 (m. sluiteri); 1887a, 186–187 [not Eurycœlum Chaudoir, 1848].—Brand., 1891b, 266.—Braun, 1892a, 741, 742, 743, 744; 1893a, 886, 887, 894.—Hoyle, 1890, 539.—Looss, 1902, 839.—Luehe, 1901, 395, 481, 482, 484–488.—Mont., 1888a, 43, 92.—Pratt, 1902a, 889, 904 (key).—Spengel, 1892.—Stiles, 1901, 177.—Stiles & Hass., 1898a, 88, 90, 91 (type, sluiteri; syn. of Hemiurus).

1890: Eurycœlium Hoyle, 1890, 539, for Eúryccelum.

sluiteri Brock, 1886a, 543–547 (in Diacope metallicus; Java); 1887a, 186–187.—Brand., 1891b, 265.—Braun, 1892f, 45–48; 1892h, 727–729, 741, 742.—Linst., 1887, ——.—Looss, 1894, 234; 1899 (to Hemiurus).—Luehe, 1901, 484, 485.—Mont., 1893, 149.—Stiles, 1901, 177.—Stiles & Hass., 1898a, 90.—Zool. Anz., 1892, v. 15, 225.

(EURYSOMA) Duj., 1845a, 388, 406 (m. squamula), subg. of Dist. [not Eurysoma Koch, 1840, arachnoid; not Gistl., 1829; not Eurysomus Young, 1866].—Baird, 1853a, 52.—Braun, 1893a, 885, 909.—R. Bl., 1891, 609.—Looss, 1899b, 535; 1902m, 750, 751.—Mont., 1888a, 92.—Stiles, 1901, 165.—Stiles & Hass., 1898a, 88, 98.

squamula (Rud., 1819) Duj., 1845a, 406 (type of Eurysoma) (to D. (Dicrocœlium) by Stoss., 1892, 20).

EUSTEMMA Dies., 1850a, 287, 317 (m. caryophyllum), 1855, 172; 1858e, 312, 322–323.—Brand., 1888a, 12, 13.—Braun, 1893a, 887, 894.—Goldb., 1855, 17.—Hoyle, 1890, 539.—Mont., 1888a, 84, 91.

caryophyllum Dies., 1850a, 317 (in Falco pileatus; Rio Parana, Brazil); 1855, 172, pl. 1, figs. 1–5; 1858e, 323.—Brand., 1888a, 5, 65 (syn. of Holost. eustemma); 1890a, 593 (syn. of Holost. eustem.).—Braun, 1893a, 903.

EURYTREMA Looss, 1907, Feb. 1, 127–134 (tod. pancreaticum Janson; Japan).

cœlomaticum (Giard & Billet, 1892) Looss, 1907, Feb. 1, 132–134, fig. 2 (syn. Dicrocœlium pancreaticum Rail. & Marotel, 1898).

pancreaticum (Janson, 1889) Looss, 1907, Feb. 1, 128–132, 133, fig. 1.—[Janson, 1889a, is not accessible to us; our earliest reference is Railliet, 1890.]

EXACOTYLE Mont., 1888a, 8 (apparently for Hexacotyle); 1891, 109.

thynni De la Roche, 1811a?—Crety, 1892c, 399 (tynni).—Mont., 1890, 195; 1891, 129.

tynni Crety, 1892c, 399 (for thynni).

EXACOTYLINÆ Mont., 1905, 77.

FAICIOLA Mueller, 1774, 70, for Fasciola.

FASCINIA Raffinesque, 1815, 151 (nomen nudum; g. of Fasciolaria; to contain species of Fasciola, but these are not named).

FASCIOLA Linn., 1758a, 644, 648–649, includes hepatica (type by elimination, also by later designation, and also by first-species rule) and intestinalis.—Abildg., 1790, 35 (syns: Fasc. intestinalis Linn., Planaria intest. Mueller, Ligula Bloch, Fasc. Gœze), 36 (to Dist.), 58.—Ariola, 1900, 426 (of Linn., 1735, = Schistocephalus).—Biehringer, 1889a, 654.—Blainv., 1824a, 514; 1828, 585–587.—E. Bl., 1847, 278.—R. Bl., 1888a, 589; 1895, 730.—Bosc., [1802a], v. 1, 263–268.—Brand., 1888a, 8.—Braun, 1892a, 674; 1893a, 883, 885, 893, 894, 908; 1895b, 138; 1900a, 1643, 1668; 1903, 3 ed., 147.—Cobbold, 1879b, 15, 1883, 401 (syn. of Dist.); 1883x, 514; 1883y, 500.—Crep., 1837a, 309; 1845b, 20–22.—Cuv., 1817a, 40.—Deslongchamps, 1824o, 386.—Dies., 1850a, 307 (of Gmelin, syn. of Hemist.), 312 (of Gmelin, syn. of Holost.), 318 (of Schrank; syn. of Diplodiscus), 319 (of Gœze, syn. of Monost.), 331 (of Linn., syn. of Dist.), 400 (of Mueller, syn. of Amphist.), 411 (of Frœlich, syn. of Notocotyle), 412 (of Gmelin, syn. of Polyst.), 573 (of Linn., syn. of Tetrabothriorhynchus), 577 (of Gœze, syn. of Caryophyllæus), 579 (of authors, syn. of Ligula), 583;

FASCIOLA—Continued.

1858e, 332 (syn. of Dist. giganteum).—Fabricius, 1794, 26, 27.—Fischer, 1799, 96.—Hahn & Lefèvre, 1884a, 515.—Hémont, 1827, 9.—Herbst, 1787a, 14, 15, 21, 31, 36.—Hoyle, 1890, 539–540 (3 species, type hepatica).—Jackson, 1888, 644, 646, 654.—Joubin, [1892a], 29.—Lamarck, 1801a, 333; 1816, 180–181.—Lamouroux, 1824a, 559, 608; 1824b, 404; 1825a, 356.—Leblond, 1836f, 4.—R. Leuck., 1863, 530.—Looss, 1899b, 551, 557; 1901, 199, 208, 658; 1902, 746, 756.—Luche, 1905, 146.—MacCallum, 1899, 707.—Macé, 1882, 25.—Montagu, 1811, 194–198, 199–200 (in poultry, see Syngamus trachealis).—Mont., 1893, 44, 153, 182; 1896, 168.—Mueller, 1774, 52, 70 (Faiciola).—Nitzsch, 1819, 397.—Nord., 1840, 613–618 (syn. Dist.).—Odhn., 1905, 339, 344, 346, 347.—Pallas, 1781c, 59.—Par., 1900, 190–197, 1 fig. (in Buenos Ayres).—Pratt, 1902, 883, 887 (key to).—Rafinesque, 1815, 151 (g. of Fasciolaria).—Rail. & Marotel, 1898, 32–33.—Rœderer, 1762, 537–539.—Rœderer & Wagler, 1762, 194–210.—Rud., 1793a, 25; 1801, 50, 54; 1802, 61–62; 1809a, 21.—St. Vincent, 1824, 608.—Schneider, 1866, 7, 9, 11.—Schrank, 1803, 185.—Slawikowski, 1819, 8, 55, 56.—Sons., 1896, 112–116.—Stiles, 1894c (s. str.); 1895l; 1895m; 1896, 159; 1898a, 22, 27, 29; 1901, 163, 165, 174, 180; 1906, 14.—Stiles & Hass., 1898a, 88–89, 90, 95, 97 (type hepatica).—Tasch., 1879, 251 (of Gmelin, syn. of Polyst.).—Vogel, 1772, 648.—Ward, 1903, 865.—Wolffhuegel, 1900, 129.

1774: Faiciola Mueller, O. F., 1774, 70, misprint.

1782: Planaria Gœze, 1782a, 168, [not Mueller, 1776, worm; not Brown, 1827, mollusk; not Lea, 1833, mollusk], includes Fasc. hepatica as Pl. latiuscula, hence type P. latiuscula Gœze, 1782.

(1782): Distoma Retzius (1782); 1790, 32 [not Distomus Gærtner, 1774, mollusk; not Steph., 1827, coleopteron; not Distoma Savigny, 1816, mollusk], for Planaria Gœze, 1782, hence same type.

1815: Distomopsis Rafinesque, 1815, 151, Distoma Zed., renamed.

1825: Distomum Crep., 1825, for Distoma.

1845: Distoma (Cladocœlium, m. hepaticum) Duj., 1845a, 382, 388, 389.

1845: Fasciolaria Anonymous, 1845, 141, in Encycl. Metropolitana, Lond. [not Lamarck, 1799, mollusk], for Fasciola Linn.

1850: "Distomum Retzius," 1782, in Dies., 1850a, 141.

1853: "Cladocalium Duj." of Pontallié, 1853, 103–105 (for Cladocœlium).

1863: "Distomum (Fasciola)" R. in Leuck., 1863, 530.

1876: Fascolia Adams, 1876, 764, misprint.

1892: Cladocœlium (Duj., 1845) as genus in Stoss., 1892, 7 of reprint.

1894: Phasciola Wilder, H. H., 1894, 24 [not Phascolus Mont., 1875, mollusk] (for Fasciola).

1898: "Clacocœlium" of Stiles & Hass., 1898a, 89, misprint.

abdominalis Gœze, 1782a, 41, 169, 186–190, pl. 16, figs. 4–9, includes F. intestinalis, 1758, and Ligula piscium Bloch.—Baird, 1853a, 95 (syn. of Lig. simplicissima).—Dies., 1850a, 580 (syn. of Lig. diagramma).—Nord., 1840, 590 (syn. of Lig. cingulum; F. a. of Zed., syn. of Lig. contortrix).—Rud., 1810a, 20 (syn. of Lig. cingulum), 18 (syn. of Lig. contortrix), 29 (syn. of L. carpionis).

æglefine Nicoll, 1907, 73 (syn. of Dist. simplex) for æglefini.

æglefini Mueller, 1776, 224 (in Gadus æglefinus; intestine); 1777, 33, pl. 30, fig. 4 (in Ga. ægl.); 1779a, 65 [pl. 3, fig. 4].—Bosc, 1802a, 272 (ægrefini, misprint).—Bruguière, 1791a, pl. 7a, fig. 15.—Cobbold, 1858b, 157.—Dies., 1850a, 343 (syn. of Dist. simplex).—Gmelin, 1790a, 3056.—Herbst, 1787a, 33.—Lamarck, 1816, 132; 1840, 619.—Lamouroux, 1824a, 563.—Levin., 1881a, 67 (syn. of Dist. sim. Rud.? Olss.).—Nord., 1840, 619 (syn. of Dist. sim.).—Odhn., 1901, 512.—Rud., 1809a, 370.—Schrank, 1788, 19.—Type of Sinistroporus 1904.

ægrefini Bosc, 1802a, v. 1, 272, misprint for æglefini.

ægyptiaca (Looss, 1896) Sons., 1896, 112; 1896, 1.—Braun, 1903, 3 ed., 152.—Looss, 1899b, 557; 1902m, 782, 783 (syn. of F. gigantea).—Ward, 1903, 866.

alata (Gœze, 1782) Rud., 1793a, 31; 1795a, 15; 1802, 84–85; 1809a, 403 (to Dist.).—Brand., 1888a, 9–60 (to Hemist.).—Dies., 1850a, 308 (to Hemist.).

alosæ Hermann, 1783a, 46, pl. 2, fig. 8a–b (in Maifisch im Rhein, Clupea alosa).—Baird, 1853a, 54, syn. of Dist. appendiculatum).—Dies., 1850a, 370 (syn. of Dist. appen.).—Rud., 1809a, 401, 437 (= Dist. clupeæ rhenanæ).

FASCIOLA—Continued.

americana Hass., 1891c, 539 (carnosa renamed) (in Bos taurus, U. S. A.).—Leuck., 1892b, 797.—Stiles, 1898a, 49.—Ward, 1895, 253 (syn. of F. magna), 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus); 1903, 866 (syn. of F. magna).

anatis (Schrank, 1788) Gmelin, 1790a, 3055 (based especially upon a parasite (Plan. teres pro parte Gœze, 1782a, 174, pl. 13, figs. 8–11) from Anas boschas domestica and made to include Cuculanus conoideus Bloch, 1782a, and Hirudo fasciolaris Mueller).—Bosc, 1802a, v. 1, 269–270.—Dies., 1850a, 383 (syn. of Dist. echinatum).—Rud., 1809a, 418, 431–432 (anatis Bruguière, 1791 = anatis domesticæ).—Stoss., 1892, 167 (syn. of Echinost. echinatum).

anguillæ Gmelin, 1790a, 3056 (refers to Leeuwenhœk arc. nat., p. 316, fig. 6) (in Anguilla).—Bosc, 1802a, v. 1, 272.—Dies., 1850a, 340 (syn. of Dist. polymorphum) (in Anguilla vulgaris (Leeuwenhœk), May, August; Greifswald).—Lamarck, 1816, 182.—Nord., 1840, 618 (syns. Dist. polymorphum and D. anguillæ).—Rud., 1809a, 363.

angulata Mueller, 1774, 58–59 (in fundo arenareo oceani).—Fabricius, 1798, 53 (to Plan.).—Verrill, ——, —— (to Amphiporus).

angusta (Rail., 1895) Looss, 1899, 557.—Braun, 1903, 3 ed., 152, fig. 98 (Gouvea's case in French naval officer at Rio; had been in Senegambia) thinks = ægyptiaca.—Looss, 1899b, 557; 1902m, 782, 783 (syn. of gigantea).—Ward, 1903, 704; 1903, 864, 866.

anseris Gmelin, 1790a, 3055 (F. verrucosa Frœlich, 1789, renamed; in Anser domesticus; Europe).—Baird, 1853a, 45.—Ben., 1858a, 1861a, 78 (syn. of Monost. verrucosum).—Bosc, 1802a, v. 1, 270.—Dies., 1840, 234; 1850a, 411 (syn. of Notocotyle triseriale).—Nord., 1840, 602 (syn. of Nocotylus triserialis).—Odhn., 1905, 366 (syn. of Catatropis verrucosa [type]).—Rud., 1809a, 331.

apiculata Rud., 1803, 31–32, Dist. stridulæ Reich, 1801, renamed; 1809a, 423, to (Echinost.).—Dies., 1850a, 386.

appendiculata Rud., 1802, 78–79, pl. 2, figs. 6a–b (nec Frœlich, 1802) (in Clupea alosa; Europe); 1809a, 400.—Baird, 1853a, 54.—Dies., 1850a, 370.—Luehe, 1901, 396.—Stiles & Hass., 1898a, 90, 96 (type of Hemiurus).

appendiculata Frœlich, 1802, 56–58, pl. 2, figs. 8–9 (nec Rud., 1802) (in Anas boschas; Europe).—Dies., 1850a, 346 (syn. of Dist. oxycephalum).—Hahn & Lefèvre, 1884a, 516 (syn. of Dist. oxyceph.).—Rud., 1814a, 105, renamed Dist. papillatum.

apri, see sub F. hepatica.

ardeæ Gmelin, 1790a, 3055 (in Ardea stellaris, int.; Europe).—Dies., 1850a, 388 (syn. of Dist. ferox).—Bosc, 1802a, v. 1, 270.—Rud., 1809a, 432.

armata Rud., 1793a, 26, F. putorii, 1790, renamed; 1802, 88–90; 1809a, 416.—Dies., 1850a, 382 (syn. of Dist. trigonocephalum).

atomon Rud., 1802, 70 (in Pleuronectes flesus; Greifswald); 1809a, 362.—Dies., 1850a, 340 (to Dist.).—Odhn., 1901, 506; 1905, 320 (to Podocotyle [type]).

barbata Linn., 1761, 505 (in Loligo; Sweden).—Abildg., 1790, 38.—Baird, 1853a, 115 (to Tetrabothriorhynchus).—Braun, 1893a, 883.—Dies., 1850a, 573 (syn. of Tetrabothriorhynchus migratorius).—Fabricius, 1780, 328–329.—Herbst, 1787a, 32.—Luehe, 1905, 334 (=Tetrarhynchus).—Mueller, 1776, 223; 1780, 203.—Pallas, 1781, 109.—Rud., 1809a, 441; 1810a, 385; 1819a 130 (syn. of Tetrarhynchus megabothrius).—Sieb., 1850, 232 (syn. of Tetrarhynchus macrobothrius).—Vaullegeard, 1899, 167.

bergi Par., 1900, 193–194, 1 fig. (in Rana platana; Montevideo).

[*bilamellata* Pallas, 1774, 20 ("Fasciolæ bilamellatæ Linnæi").]

bilis (Braun, 1790) Gmelin, 1790a, 3054 in Falco melanaëtus.—Bosc, 1802a, v. 1, 269 (billis).—Dies., 1850a, 376 (syn. of Dist. crassiusculum).—Rud., 1809a, 408.

billis Bosc, 1802a, v. 1, 269, for bilis.

binodis Mueller, 1776, 224 (in fish); 1779a, 69 [pl. 30, fig. 8]; 1788, 34–35.—Bosc, 1802a, 271–272.—Bruguière, 1791, pl. 79, fig. 24.—Dies., 1850a, 379 (to Dist.).—Gmelin, 1790a, 3056.—Herbst, 1787a, 33.—Rud., 1809a, 439.—Schrank, 1788, 20.

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blennii Mueller, 1776a, 224 [in Blennius viviparus]; 1777, v. 1, 32, 33, pl. 30, fig. 5, v. 2, 53, pl. 78, figs. 9–12 (in Cottus scorpius and Blennius viviparus); 1779a, 64, 66 [pl. 30, fig. 5]; 1780, 217; 1784, 116, pl. 28, figs. 9–14.—Bosc, 1802a, v. 1, 272.—Bruguière, 1791a, pl. 79, figs. 16–18.—Dies., 1850a, 344 (syn. of Dist. divergens).—Gmelin, 1790a, 3057.—Herbst, 1787a, 33.—Lamarck, 1816, 183.—Nord., 1840, 619 (syn. of Dist. divergens Rud.).—Rud., 1793a, 30; 1809a, 371.—Schrank, 1788, 19.

boschadis Schrank, 1803, 209.

boum Gmelin, 1790a, 3054, see sub hepatica boum.

bramæ Mueller, 1776, 224, v. 1, 33, pl. 30, fig. 6 (in Cyprinus brama; intest. Norway, Denmark); 1779a, 66 [pl. 30, fig. 6].—Bosc, 1802a, v. 1, 274.—Bruguière, 1791, pl. 79, fig. 19.—Cobbold, 1858b, 157.—Dies., 1850a, 341 (syn. of Dist. globiporum).—Gmelin, 1790a, 3058.—Herbst, 1787a, 33.—Looss, 1894a, 41 (syn. of Dist. gl.); 1902m, 757 (and Dist. gl.), 758, 760 (perhaps an Allocreadium, Bunodera, or Asymphylodora), 763, 765.—Nord., 1840, 619 (syn. of Fasc. globifera).—Rud., 1809a, 364.—Schrank, 1788, 20.—Sramek, 1901, 107 (syn. Dist. gl.).—Stiles, 1901, 168, 169, 192.—Stiles & Hass., 1898a, 94, 95, 97 (= globipora, type of Sphærost.).

brunnea Mueller, 1774, 54.—Johnston, 1865, 9.

buchholzii "Jœrdens, 1801," of Braun, 1889a, 320 (lapsus for "Fasc. hepatica, ovata plana, Buchholzii" = Dicrocœlium lanceatum).—Stiles, 1898a, 55.

buteonis Gmelin, 1790a, 3054 (in Falco buteo) based on Gœze, 1782a, 85.—Bosc, 1802a, v. 1, 269.—Rud., 1809a, 430 (= Dist. buteonis (in Falco buteo)).

candida Mueller, 1774, 71 (in littore Grœnlandiæ sub lapidibus).—Verrill, —— (? syn. of Tetrastemma candidum (F.) Oersted).

capitata Mueller, 1774, 70.

carnosa Hass., 1891a, 208–209, 1 fig. (in Bos taurus; U. S. A.); 1891b, 464–465; 1891c, 359 (syn. of F. americana).—Huber, 1896a, 575, 576.—Leuck., 1902b, 797, 798.—Stiles, 1898a, 49.—Ward, 1895, 253 (syn. of F. magna), 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus); 1903, 866 (syn. of F. magna).

caudata Mueller, 1774, 70.—Buttel-Reepen, 1902, 166, 170, pl. 6, fig. 6.—Schrank, 1803, 171 (= Plan. acuminata).—Slawikowski, 1819, 38.

caudata Bosc 1802a, v. 1, 271, pl. 9, fig. 6 (nec Mueller, 1774) (in dorade = ? Chrysophys aurata: Coryphæna hippurus).—Dies., 1850a, 373 (syn. of Dist. tornatum); 1859c, 431 (syn. of D. tornatum).—Rud., 1809a, 436 (= Dist. coryphænæ); 1819a, 685.

cervi (Schrank, 1790) Zed., 1790, 65–74, pl. 3, figs. 8–11.—Dies., 1836, 247; 1850a, 401 (syn. of Amphist. conicum).—Fischder., 1903h, 504 (type of Paramphist.), 506 (in Cervus elaphus).—Rud., 1809a, 351.—Schrank, 1803, 214.—Stiles, 1898a, 64.—[Type of Paramphist. 1901.]

ciliata Mueller, 1774, 55 (free form).

cincta Rud., 1803, 31 (in Tringa vanellus); 1809a, 422, to D. (Echinost.).—Dies., 1850a, 386 (to Dist.) (in Vanellus cristatus, V. melanogaster).

[*cinerea* (anatomical term).]

cirrata [Rud., 1802 (see Dist. cirratum)]; 1809a, 376 to Dist.—Dies., 1850a, 350 (to Dist.) (Griefswald, June).

cirrhata Rud., 1802, v. 3 (1), 66–67, pl. 2, fig. 4 (in Corvus frugilegus).—Braun, 1902b, 43 (syn. of Plagiorchis cirratus).

clavata Menzies, 1791, 187–188, pl. 17, fig. 2 (in Scomber pelamys; Pacific) [type of Hirudinella, 1828]; 1794, 58–59, pl. 8, fig. 2.—Baird, 1853a, 59.—Blainv., 1824a, 518 ("hirudinelle"); 1828, 586.—Buttel-Reepen, 1900a, 586; 1902, 166, 168, 178, pl. 6, fig. 3.—Cobbold, 1879b, 459.—Darr, 1902, 663.—Dies., 1850a, 366 (to Dist.); 1859c, 431 (Dist. clavata Rud., partim).—Rud., 1809a, 391.—Stiles, 1901, 192.

clupeæ Schrank, 1788, 20 (in rheinischen Mayfische).—Baird, 1853a, 54.—Dies., 1850a, 370 (syn. of Dist. appendiculatum).—Rud., 1809a, 437.

collurionis Schrank, 1790, 123 (in Lanius collurio); 1803, 211.—Dies., 1850a, 396 (to Dist.) (in Lanius collurio).—Rud., 1809a, 430 (to Dist.).

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colubri Bosc, 1802, v. 1, 271, pl. 9, figs. 1–3 (in couleuvre d'Amérique).—Cobbold, 1859d, 364 (syn. of Dist. bosci).—Dies., 1850a, 398 (syn. of Dist. colubri americani) (in Coluber sp. americana).—Rud., 1809a, 434 (to Dist.).

colymbi immeris Viborg, 1795, 241 ["Fasciola s. Ligula].—Dies., 1850a, 579.—Rud., 1810a, 27 (to Ligula).

coryphænæ Bosc, 1802a, v. 1, 271, pl. 9, fig. 5 (in dorade).—Baird, 1853a (=Hirudinella clavata), 59.—Buttel-Reepen, 1902, 166, 168, 170, pl. 6, fig. 5.—Dies., 1850a, 373 (syn. of Dist. tornatum); 1859c, 431.—Rud., 1809a, 436 to Dist.; 1819a, 685.

coryphænæ hippuridis Tilesius in litteris Rud., 1809a, 436 (syn. of D. coryphænæ), 437.—Baird, 1853a, 59 (=Hirudinella ventricosa).—Buttel-Reepen, 1902, 166, 168.—Cobbold, 1879b, 461.—Dies., 1850a, 373 (syn. of Dist. tornatum).

crassa Rud., 1793a, 27 (=Fasc. melis Gmelin, renamed).

crenata Rud., 1802, 76–78, pl. 2, fig. 5, a–b (in Gasterosteus aculeatus, Pleuronectes maximus); 1809a, 404 (in Gast. acul., Pleur. max.).—Baird, 1853a, 54 (=Dist. appendiculatum).—Dies., 1850a, 371 (syn. of Dist. app.).—Lander, 1904a, 1 (to Hemiurus).—Luehe, 1901, 399, 400.—Odhn., 1905, 352 (type of Brachyphallus).

crenata Frœlich, 1802a, 60–62, pl. 2, figs. 10–11 (nec Rud. (in Fulica chloropus)).—Dies., 1850a, 384 (syn. of Dist. uncinatum) (in Gallinula chl., May & July).—Rud., 1814a, 102 (=Dist. unc.).

crenata Mueller, 1774, 64 (nec Rud., nec Frœlich).

cucumerina Rud., 1804, 166 (in liver of Pleuronectes maximus).

cygnoides Schrank, 1803, 212.

cylindracea (Zed., 1800) Rud., 1802, 83–84; 1809a, 393 (in Rana esculenta, R. temporaria).—Lamarck, 1816, 183.—Looss, 1894a, 64 (to Dist.).—Nord., 1840, 620 (to Dist.).—Stiles & Hass., 1898a, 84.

cyprini carassii Viborg, 1795, 242.

delicatulum (Rud., 1809) Blainv., 1828a, 585.

denticulata Rud., 1802, 91–92, pl. 2, fig. 8, a–c (in Sterna hirundo); 1809a, 424.—Dies., 1850a, 392 (to Dist.).

disticha Mueller, 1776a, 224; 1788, 35, pl. 30, fig. 9; 1779a, 69, pl. 30, fig. 3 [sic]= fig. 9.—Bosc, 1802a, v. 1, 272.—Bruguière, 1791a, pl. 79, fig. 25.—Dies., 1850a, 378 (to Dist.).—Gmelin, 1790a, 3056.—Herbst, 1787a, 33.—Rud., 1809a, 367, 440 (to Dist.).—Schrank, 1788, 20; 1803, 212–213.

echinata Nord., 1840, 621 (syn. of F. trigonocephala).

elaphi Gmelin, 1790a, 3054 (Festucaria cervi, renamed) (in Cervus elaphus).—Bosc, 1802a, v. 1, 269.—Dies., 1836, 247; 1850a, 401 (syn. of Amphist. conicum).—Fischder., 1903h, 504 (syn. of Paramphist. cervi), 506.—Nord., 1840, 627 (syn. of Amphist. con.).—Rud., 1809a, 350.—Stiles, 1898a, 64.—Ward, 1895, 256 (syn. of Amphist. conicum), 332 (in Bos taurus), 335 (in Ovis aries).

elegans Rud., 1802, 65–66 (in Sperling, Greifswald).—Braun, 1902b, 38 to Plagiorchis.—Dies., 1850a, 350 (to Dist.).—Rud., 1809a, 375.

epatica Rosa, 1794, 5, dell' Ardea purpurea.—Braun, 1900h, 19 (? syn. of Clinost. heterost.).—Dies., 1850a, 353 (syn. of Dist. heterost.).

epatica Brera, 1809a, 92–98, pl. 1, figs. 24–25.—Sons., 1884, 21.—For hepatica.

equi Gmelin, 1790a, 3054, var. of Fasc. hepatica.

eriocis Mueller, 1784, 92, pl. 72, figs. 4–7; 1788, 42, pl. 72, figs. 4–7 (in Salmo eriox).—Bosc, 1802a, v. 1, 274.—Bruguière, 1791a, pl. 80, figs. 3–4.—Dies., 1850a, 363 (syn. of Dist. hyalinum).—Gmelin, 1790a, 3057.—Harz, 1881c, 5 (syn. of D. hyalinum).—Lamarck, 1816, 183.—Nord., 1840, 619–620 (includes D. hy., D. rosaceum, D. perlatum).—Rud., 1809a, 389.

excavata Rud., 1803, 28–29 (in Storch, Ardea ciconia; Greifswald); 1809a, 399.—Dies., 1850a, 309–310 (to Hemist.).

excisa (Rud., 1819) Blainv., 1828a, 586.

farionis Mueller, 1784, 91, pl. 72, figs. 1–3 (in Salmo fario); 1788, 42, pl. 72, figs. 1–3.—Bosc, 1802a, v. 1, 274.—Bruguière, 1791a, pl. 80, figs. 1, 2.—Dies., 1850a, 380 (syn. of Dist. laureatum).—Frœlich, 1802a, 62–63, pl. 2, figs. 4, 5.—Gmelin, 1790a, 3058.—Knoch, 1862, 19.—Nord., 1840, 621 (syn. of F. laureata).—Odhn., 1905, 353.—Rud., 1809a, 413; 1814a, 102 (syn. of Dist. laureatum).

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ferox Rud., 1795a, 15–17 (in Ardea ciconia; Greifswald); 1802, 90–91; 1809a, 426 to D. (Echinost.).—Dies., 1850a, 388 (to Dist.).—Nord., 1840, 622 (syn. of Fasc. trigonocephala).

fimbriata Gœze, 1782a, 180, pl. 15, figs. 4–5.—Abildg., 1790, 32 (cf. Phylline).—Baird, 1853a, 97 (syn. of Caryophyllæus mutabilis).—Ben., 1858a, 1861a, 115 (syn. of Car. mutab.).—Braun, 1894.—Dies., 1850a, 577 [Fasciolaria].—Nord., 1840, 633 (syn. of Car. piscium).—Rud., 1810a, 9 (=Car. mut.).

flaccida Mueller, 1774, 57–58 (free form).

furcata (Bremser, 1819) Blainv., 1828, 586.

fusca Pallas, 1774, 21–22, pl. 1, fig. 13, a–b (in aq. stag.; Europe).

fusca Bosc, 1802a, v. 1, 271, pl. 9, fig. 4 (in dorade) [not Pallas, 1774].—Baird, 1853a, 59 (=Hirudinella ventricosa).—Buttel-Reepen, 1902, 166, 168, 170, pl. 6, fig. 4.—Cobbold, 1879, 459, 460, 461.—Darr, 1902, 664.—Dies., 1850a, 366 (syn. of Dist. clavatum); 1859c, 431.—Herbst, 1787a, 36.—Poirier, 1885, (to Dist.).—Rud., 1809a, 436.

gibbosa Rud., 1802b, 81–82, pl. 2, fig. 7 (in Esox belone); 1809a, 399 to Dist.—Odhn., 1905, 356 (to Lecithaster).

gigantea (Dies., 1858) Cobbold, 1858; 1860a, 4 (in Camelopardalis giraffa); 1864, 161 (see F. gigantica); 1876, 303; 1879b, 25, 322, 421.—R. Bl., 1895, 733–734 (includes F. hepatica var. angusta); 1900, 488.—Braun, 1893a.—Dies., 1858.—Fitz, 1876b, 514.—Gervais et Ben., 1858.—Hoyle, 1890, 539.—Leuck., 1863; 1879–93.—Looss, 1899b, 557; 1902m, 782, 783 (syns. gigantica, angusta, ægyptiaca).—Sons., 1889, 275; 1890; 1896, 113, 114.—Stiles, 1895, 139–143, pl. 5 (includes Dist. hepaticum pars Gervais & Ben.); 1898a, 49.—Stoss., 1892, 9 (to Cladocœlium).—Also reported for Bos taurus.

gigantica Cobbold, 1855a, 262–266, pl. 7, figs. 1–15 (in liver of Giraffa camelopardalis); 1855b, 3–7, pl. 7, figs. A. B., 1–15; 1856a, 108–109; 1858b, 167; 1860a, 4.—Braun, 1903, 3 ed., 152 (places Gouvea's (1895) case here); 1906, 157 (in giraffe).—Dies., 1858c, 332 (to Dist.).—Stiles, 1898a, 23, 29, 48, 49, 50, 51, 137, 140, 141, fig. 27.—Ward, 1903, 866 (closely related to F. angusta).

glauca Mueller, 1774, 60.

globifera Lamarck, 1816, 182 for globipora 1802.—Baird, 1853a, 53.—Lamouroux, 1824a, 563.—Nord., 1840, 618–619 (includes Dist. globiferum, D. globiporum, Fasc. bramæ).

globipora Rud., 1802, 72–74 (in Cyprinus erythrophthalmus); 1809a, 365.—Dies., 1850a, 341 (to Dist.).—Looss, 1894a, 41 (to Dist.); 1902m, 763.—Stiles, 1901, 168, 169, 192.—Stiles & Hass., 1898a, 95 (type of Sphærostoma).

grossa Mueller, 1774, 67.—To Planaria in 1776.

gruis Gmelin, 1790a, 3055 (in gruis).—Baird, 1853a, 55 (=Dist. echinatum).—Bosc, 1802a, v. 1, 270.—Dies., 1850a, 383 (syn. of Dist. echinatum).—Rud., 1809a, 432.

gulo Mueller, 1774, 56 (free from).—Schrank, 1803, 166 (to Plan.).

halecis Gmelin, 1790a, 3058 (in halece).—Dies., 1850a, 372 (syn. of Dist. ocreatum).—Mont., 1891, 496.—Rud., 1809a, 398 (syn. of D. ocr.).

helluo Mueller, 1774, 64–65.—Johnston, 1865, 13.—Schrank, 1803, 169 (to Plan.).

hepatica Linn., 1758a, 648–649 (in aquis dulcibus ad radices lapidum, inque hepate pecorum. Diss. de Ovibus: Europe); 1761, 505; 1766, 1077; 1792, 3053–3054; 1801, 33–34.—Abildg., 1790, 36 (to Dist.).—Adams, 1887, 318.—Adenot, 1863, 112.—Aitken, 1866, 804, 839; 1872, 146, 205; 1874, 58.—Aldrovandus, (1602).—Anaker, 1892c, 94.—Andral, 1829d, 615.—Andry, 1701, 121–122.—Ariola, 1900, 426 (of Linn., 1735, syn. of Schistocephalus dimorphus).—Armatage, 1895, 429, 430, 432, 433, 440.—Australian Pastorialists Rev., 1896, v. 5, 610–611.—Baillet, 1866b, 15, 18, 90, 99 (to Dist.).—Baird, 1853, 49 (pars= Schistocephalus dimorphus).—Barbut, 1783, 14–15, pl. 2, fig. 1.—Bauhin, (1677).—Ben., 1858a, 1861a, 172.—Bert & R. Bl., 1885, 585–586, fig. 539.—[Bidloo, 1698a.]—[Biggs, 1890a, 36–37.]—Blainv., 1828, 585.—[Blakeway, 1879a.]—E. Bl., 1847, 279–291.—R. Bl., 1888a, 543 (to Dist.), 602 (of Bloch, 1782, syn. of Dist. lanceolatum); 1890, 66–75, figs. 28–33; 1894g, 461–462; 1894h; 1895, 730–733, figs. 78–79; 1900g, 488.—Bloch, 1782a, 5–6, pl. 1, figs. 3–4.—Blumenbach, 1825a, 241.—[de Bonis, 1876a, 155.]—Borlase, 1758a.—Bosc [1802a], v. 1, 268.—[Bonvicini, 1881a, 133–134.]—Braun, 1893a, 883,

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1893b, 180; 1900h, 9; 1901e, 327; 1903, 3 ed, 147–151, figs. 92–97 (syns. Dist. hep. Retz., Fasc. humana Gmelin, Dist. caviæ, Cladocœlium hep. Stoss), 150; 1906, 140, 142, 143, 145, 150–156, 157, figs. 74, 77, 81, 83–88.—Brett, 1881b, 139–142.—[Brown, 1881a; 1882b; 1886b.]—Bruguière, 1791, pl. 79, figs. 1–8.—[Bruck, 1865a, 33–35.]—de Bry, 1879.—Chabert, 1787a, 25 (63–64); 1791, 152.—Civini, 1842.—Clerc, 1907, 557, 558.—Cobbold, 1855a; 1855b, 3, 4, 6; 1866, 6; 1872b, 91; 1876, 210, 211, 303; 1879b, 14, 25, 28, 48, 50, 315, 317, 318, 322–331, 356, 404, figs. 17, 61; 1882, 699–704, pl. vi, figs. 2–8; 1883v, 500; 1884g, 976.—Cuvier, 1798, 633–634; ——, v. 2, 339; 1817a, 41–42; 1830, 263–264; 1831a, 364.—Daldorf, 1793, 159 (hepatum).—Dandolo, 1806, 28 pp.—Darr, 1902, 649, 652, 657, 663, 684, 687.—[Daubenton, 1750–52.]—Dav., 1877a, 2 ed., lxxv, figs. 36–38.—[Delafond, 1854a, 3–56, figs. 12–13.]—Delorme, 1861, 241.—Desmars, 1762.—[Dickens, 1830a, 645–647.]—[Didry, 1832a, 139–147.]—Dies., 1850a, 332 (to Dist.), 333 (of Bloch, syn. of Dist. lanceolatum), 401 (of Mueller, syn. of Amphist. conicum), 584 (pars of Linn., syn. of Schistocephalus dimorphus).—Dinwiddie, 1892a, 3.—Dowker, 1882a, 10, 11, 12, 13, pl. 1, fig. B. 1, pl. 2 E, figs. 1–2.—Drosse (1856a).—Dunglison, 1893a, 424, 821.—Eber, (1798a), 22.—[Ellis, 1749.]—[Faber, 1670, 147.]—Fabricius, 1780, 327–328 (in sheep); 1794, 29.—Fil., 1854a, 27.—Fischder., 1903h, 504 (of Mueller, syn. of Paramphist. cervi).—La Fosse, 1772, 157; 1774, 320; 1779, 139.—Frœlich, 1802a, 55–56.—Gabucinus, 1597.—Galli-Valerio, 1898b; 1898c, 7, 8.—Gamb., 1896a, 67.—[Gemma, 1575a, 40.]—Gerlach, 1854; 1862.—[Gesnerus, 1551.]—Giard & Billet, 1892a, 613.—Gmelin, 1790a, 3053–3054.—Gœze, 1782a, 169–172, pl. 14, fig. 1.]—Gomy, 1897a, 374.—Gurlt, 1849a, 120.—Hahn & Lefèvre, 1884a, 516 (to Dist.).—Haldemann, 1851, 46, pl. 77, fig. 30.—[Hamont & Fischer, 1834a; (1834b).]—Harley, 1876, 255–256, figs. 208, 209.—Harrop, 1870a, 12–16 (heptica).—[Heide, 1686–1688, 46–47 (in sheep).]—Herbst, 1787a, 31–32, pl. 4, figs. 1–2 [=Dicrocœlium lanceatum].—Hodgson, 1838a, 528–538.—Hoyle, 1890, 535–540.—Huber, 1896, 574.—[Huzard & Desplas, 1797a, 10.]—[Huzard & Tessier, 1817a.]—Jaksch, 1889a, 186.—[Joseph, 1883e, 171–172; 1883f, 322–323.]—Khouri, 1904, 78 (as cause of halzoun, at Liban).—King, 1836a, 95–101.—Kingsley, 1885, 191–194, figs. 168–174.—Klencke, 1844, 420 pp.—Kowal., 1902, 26, 8.—Kriwonogow, 1886.—[Kulmus, 1721, 596.]—Lamarck, 1801a, 333.—[Lamouroux, 1824a, 560, 561, 562, 563.]—Lander, 1904a, 10.—Laveran & R. Bl., 1895, 8–33, 186–188.—[Leeuwenhoek, 1715, 1–33, 14 figs.]—Leuck., 1879, 33; 1886, 25; 1892b, 798.—Looss, 1899, 557, 742; 1902m, 782; 1905, 110; 1907, Feb. 1.—Luehe, 1901, 167; 1902, 224; 1905, 334.—Marshall, J. T., (1883), 10 (= a parasite of Limnæa truncatula).—Marshall, W., 1887.—Martens, 1824.—Mojkowski, (1888a); 1888b, Mar., 118.—Moniez, 1896, 86, 90–114, 115, 118, 119, 121, 150, 158, figs. 19, 20, 22, 23.—Much., 1898, 10.—Mueller, O. F., 1774, 52–53; 1776; 1782.—Mueller, P. L., 1775, 42–43.—Neumann, 1888, 507–564, figs. 229–238; 1892, 504–528, figs. 271–281; 1892, 517–543, figs. 271–281.—[Nichols, 1755, 246 248.]—Nord., 1840, 618.—Odhn., 1905, 338–339, 340, 344.—Olss., 1876, 13.—Otto, 1816, vii.—Pallas, 1760; 1768, 269–271; 1781, 79.—Parkes, 1891, 79.—Par., 1887, 489.—Perroncito, 1882, 273–276, figs. 115–116.—[Pecquet, 1668.]—Poir., 1883, 74.—Pratt, 1898, 357.—Rail., 1899, 345.—Rail. & Marotel, 1898, 34, 37.—[Redi, 1684, 133; 1729.]—Roger, 1901, 94, 95.—[Romberg, 1706, 69–70.]—Rozier, 1774.—Rud., 1793a, 28–29; 1802, 62–64 (cf. lanceolata); 1804, 165; 1805, 37–38, a. hominis, b. equi, c. tauri; 1809a, 350, 353; 1810a, 57 (pars syn. of Bothriocephalus solidus).—Ruysch, 1737, 23.—[Schæffer, 1726, 57.]—Schrank, 1788, 17; 1803, 210.—Schwarze, 1885, 41.—Shaw, 1901, 1027.—Sieb., 1845, 223.—Simon, 1897, 222.—Simonds, (1862), 21.—Smith, Wm. A., 1863, 35–36, fig. 7.—Sons., 1878, 615 (epatica); 1884, 59, 61; 1889, 275; 1891, 254; 1896, 112–116; 1896, 4 pp., varieties of; 1896, 295, 302, 303, 315; 1897, 250, 251, 252.—Spengel, 1905, 270.—Steel, 1881, 204 (in cattle).—Stewart, 1898, 328 331, figs. 9–17.—Stieda, 1867, 52–59, pl. 2.—Stiles, 1896, 205; 1898a, 22, 29, 30, 31, 32, 33, 34, 35, 37, 38, 41, 42, 43, 45, 51, 52, 53, 55, 56, 57, 137, 138, 139, 140, 141, 142, 143, figs. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17; 1901, 177; 1901, 180; 1901d; 1901e; 1902, 204; 1902, 220, 221, 222; 1903, 884.—Stiles & Hass., 1898a, 88, 89, 97.—Stoss., 1892, 7 (to Cladocœlium).—Sweiten [1758, 89].—[Thomson, 1855, 188.]—Turton, 1807.—Tyson, 1903, 3 ed., 1180 (to Dist.).—Verrill, 1870, 170, 176, 177, 178, 213, 214.—Veterinarian, 1879, v. 52, 738–741.—Walter, (1866), 63–64.—Ward, 1895, 246–252, *pl. 1*, figs. 1–13, 253 (in part of Dinwiddie, 1889, to Fasc. magna), 256 (*syns. Planaria* latiuscula Gœze, Dist. hep. Abildg., Fasc. humana Gmelin,

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F. lanceolata Rud., 1803, Fasciolaria hep., Distomata hominis Taylor, Dist. caviæ Sons.); 1903, 704, 706; 1903, 863, 864, 865 (syns. Dist. hep. Retzius, Fasc. humana Gmelin, Dist. caviæ Sons., Cladocœlium hep.), 866 (syn. probably Hexathyridium venarum), 867, 870, 871.—[Wepfer, 1716.]—Wernicke, 1886, 304.—[Willius, 1674-1675.]—Ztschr. f. mikr. Fleischschau, Berl., 1880.—Zuern, 1882, 207, pl. 4, figs. 5–8.

———, *hepatica*, anatomy of: Jackson, 1888, 643–645, 649, 651, 652, 653.—Ramdohr, 1814, 128–131 (in sheep).—See also foregoing entries.

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———, ———, development of: Brown, 1882b, 624–630.—Rossouw, 1895, 578–579 (origin of).—Schubmann, 1905, 571–606, figs. 1–51; 1905, Oct. 10, 564–565; 1905, Oct. 18, 597.—Sons., 1884, 315; 1884, 76–77.—Thomas, 1881, Aug., 543–547; 1881, Sept., 629–633; 1881, Oct., 705–714; 1881, 740–741; 1881, Nov., 776–782; 1881, Dec., 847–853; 1881, v. 17, 1–29; 1882, Oct. 19, 606–608; 1882, v. 18, 439–455, figs. 1–6; 1882, Dec., 388–393; 1883, Mar., 180–189; 1883, May, 338–343; 1883, June, 404–409, figs. 1–6; 1883, July, 469–470 (and prevention); 1883, Aug., 550–557; 1883, Sept., 621–633; 1883, Oct., 681–690, figs. 1–20; 1883, v. 17, Oct., 270–286, figs. 1–18; 1883, v. 19 (37), 276–305, figs. 1–20; 1883, Nov., 344–352, fig. 19.—Veterinarian, Lond., 1880, May, 332–333; 1881, June, 390–392.—See also life cycle of.

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———, ———, intermediate host of: Cobb, 1898c, 36–38, 2 figs.—Fielder, 1896a, 24–28, 139–140, 146–147, figs. 1–7.

———, ——— in various animals: [Frommann, 1688c, 252–259; 1755a, 291–294].—In cattle: Cocu, 1897a, 369–371 (heart); 1898b, 98 (heart).—Galli-Valerio, 1901c, 364.—[Hutcheon, 1893h, 347 (death).]—Mills, 1876.—Morot, 1890, 191–193 (erratic).—Rail., 1897, July 30, 369–371 (heart).—Rail. & Morot, 1885, 285 (lungs).—Ward, 1895, 332 (biliary ducts).—Horse: Adams, 1876, 764–765 (India).—Galli-Valerio, 1901c, 364.—Ward, 1895, 338 (biliary ducts).—Man: Ashford, King & Igaravidez, 1904, Dec. 1, 92 (Porto Rico).—Looss, 1905, 88.—Ward, 1895, 238, 246, 328 (biliary ducts).—Wilson, 1880, Nov., 413–417.—Sheep: Camper, 1762a, 304, pl. 4.—Dupuy, 1822a, 29–36.—Galli-Valerio, 1901c, 364.—Halsted, 1883a, 741–748, figs. 1–11.—[Hutcheon, 1889e, 235 (Capetown); 1892m, 141; 1893o, 403–404; 1893r, 425–426.]—Morton, 1839, Nov., 735–738, fig. 1.—Rhodesian Agric. J., Cape Town, 1906, v. 3 (5), June, 529.—Ward, 1895, 238–246.—Miscellaneous: [Cadéac, 1885a (Equus asinus, female); 1885b (Equus asinus, female).]—Cobbold, 1858b, 167 (Lepus cuniculus).—Ward, 1895, 238 (man, cattle, sheep, goat, horse, ass, hog, rabbit, cat), 246 (stag, squirrel, elephant), 335 (Ovis aries: biliary ducts).

———, life cycle of: Fagge & Pye Smith, 1902, 4 ed., 475 (syn. Dist. hep.).—Jackson, 1883a, 248–250.—Thomas, 1883, Jan., 99–133, pls. 2–3, figs. 1–26; 1883, v. 23, 8.—See also development of.

hepatica ægyptica (Looss, 1896), Stiles, 1898a, 23, 48, 49, 50, 139, 140, figs. 25–26.—Braun, 1903, 3 ed., 152 (in buffalo, cattle, sheep, goats); 1906, 157 (=F. angusta=F. ægyptiaca).—Looss, 1902m, 782.—Sons., 1896, 115; 1896, 295.

hepatica angusta Rail., 1895, 338–340 (in cattle; St. Louis, Senegal, Africa); 1895, 702.—R. Bl., 1895, 733 (=F. gigantea).—Braun, 1903, 3 ed., 151 (cattle, liver); 1906, 156, 158, fig. 89.—Gomy, 1897a, 376.—Looss, 1902m, 782.—Rail. & Gomy, 1899, 349.—Stiles, 1898a, 23, 48, 49, 137, 140, figs. 23, 24.—Sons., 1896, 2; 1896, 113, 115.—Veterinarius, 1898, 328.

hepatica apri Gmelin, 1790a, 3054 (in Sus scrofa; from Le Clerc, 1715a, 119).

hepatica boum Gmelin, 1790a, 3054 (in Bos taurus; Europe) (=Planaria latiuscula Gœze, 1782a, pro parte, renamed=Fasc. hepatica).

hepatica caviæ Sons., 1896, 112–116; 1896, 4 (in Cavia).—Stiles, 1898a, 48, 139.

hepatica cervi Gmelin, 1790a, 3054 (in Cervus).

hepatica equi Gmelin, 1790a, 3054 (in Equus caballus).

hepatica ovata plana Buchholzii of Jœrdens, 1802a, 64–66, pl. 7, figs. 13–14 (see Dicrocœlium lanceatum).

FASCIOLA—Continued.

hepatica porcorum Gmelin, 1790a, 3054 (in Sus scrofa domestica; Europe) (=Plan. latiuscula Gœze, 1782a, pro parte, renamed=F. hepatica).

heterophyes (Sieb., 1852) Moquin-Tandon, 1860.—R. Bl., 1888a, 625–627 (to Dist.).—Ward, 1895, 328 (in Homo).

hirundinis Frœlich, 1791, 75–76 (in Thurmschwalbe).—Baird, 1853 (syn. of D. maculosum).—Braun, 1901, 566; 1902b, 45, 46 (syn. of Plagiorchis mac.).—Dies., 1850a, 349 (syn. of D. mac.).—Linst., 1901, 197 (syn. of D. mac.).—Rud., 1809a, 374.

humana Gmelin, 1790a, 3053 (in Homo).—R. Bl., 1888a, 543 (syn. of D. hepaticum).—Braun, 1903, 3 ed., 147 (syn. of F. hepat.); 1906, 150, fig. 83 (syn. of F. hep.).—Cobbold, 1866, 6.—Dunglison, 1893, 424.—Rud., 1809a, 353.—Stiles, 1898a, 29.—Ward, 1895, 246 (syn. of F. hepat.), 328 (in Homo), 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus); 1903, 865 (syn. of F. hepat.).

inflexa Rud., 1802a, 82–83 (in Cyprinus jeses); 1809a, 395.—Dies., 1850a, 365 (to Dist.) (in Leuciscus jeses; Apr., Greifswald).

intestinalis Linn., 1758a, 649 (in intestinis piscium); 1761, 505.—Abildg., 1790, 34.—Baird, 1853 (syn. of Ligula simplicissima).—Barbut, 1783, 15, pl. 2, fig. 2.—Blumenbach, 1825, 242.—Bosc, 1802a, v. 1, 277 (syn. of Lig. abdominalis).—Braun, 1893a, 883; 1900a, 1642.—Bremser, 1819.—Dav., 1877, 260.—Dies., 1850a, 580 (syn. of Lig. diagramma).—Gœze, 1782a, 41, 183 (=a "Gattung" of Fasc. Gœze).—Herbst, 1787a, 32, 41 (syn. of Lig. piscium).—Luche, 1905, 334.—Montin, 1763a, 113–118; 1766a, 122–127 (in Homo) [evidently a tapeworm, det. as F. i. Linn.].—Nord., 1840, 590 (syn. of Lig. cingulum).—Pallas, 1781, 95.—Rauh, 1779, 11.—Rud., 1810a, 20 (syn. of Lig. cingulum), 25 (syn. of Lig. mergorum).—Steenstrup, 1857, 186–195 (in Stichling); 1858, 298–312; 1859, Dec., 475–485.—Wegelin, 1779, 8.

intestinalis Gueldenstædt, (?1791a), 115 (in Sorex moschatus).—Dies., 1850a, 617 (syn. of Cephalocotyleum mygales moschatæ Rud.).—Rud., 1810a, 24 (=Ligula soricis moschati).

jacksonii Cobbold, 1869, 48–49, in Indian elephant; 1870, 47–49; 1873, 13; 1875, 733–743; 1879b, 393, 394, 395, 396, 397; 1882, 223–258, pls. 23, 24.—Braun, 1892a, 567, 650, 674, 710 (jacksoni); 1893a, 875, 910.—Fitz, 1876a, 513–518; 1876b, 513–518; 1876c, 854 (jacksoni).—Jackson, 1847, ——.—Linst., 1878, ——.—Looss, 1899b (to Fasciolopsis).—Sons., 1889, 275 (jacksoni); 1896, 114, 115 (jacksoni).—Stiles, 1895, 144–147, pl. 6, 213–215; 1898a, 29.—Veterinarian, Lond., 1876, 854 (jacksoni).

jesis Gmelin, 1790a, 3058 (in Cyprinus jeses intest.; Europe).—Bosc, 1802a, v. 1, 275.—Dies., 1850a, 365 (syn. of D. inflexum Rud.).—Rud., 1793, 30; 1809a, 372, 395.

lactea Mueller, 1774, 61–62 (in rivo sub foliis nymphææ ac in Palustris frequens).—Schrank, 1803, 167 (to Plan.).—Johnston, 1865, 10.

lagena (Braun, 1788) Gmelin, 1790a, 3057 (in Perca fluviatilis).—Baird, 1853a, 57 (syn. of Dist. nodulosum Zed.).—Bosc, 1802a, v. 1, 273.—Rud., 1809a, 411 (syn. of D. nod.).

lanceolata Rud., 1803a, 24–25 (nec Schrank, 1790) (in Homo; Europe); 1809a, 353 (syn. of Dist. hepaticum).—R. Bl., 1888a, 543 (syn. of D. hep.), 602 (syn. of D. lanceolatum).—Braun, 1903, 3 ed., 157, 166 (to Dicrocœlium).—Dies., 1850a, 333.—Dunglison, 1893, 424 (lanceolatum).—Stiles, 1898a, 55.—Stiles & Hass., 1898a, 87 (=lanceatum, type of Dicrocœlium).—Ward, 1895, 246, 328 (in Homo), 332 (in Bos taurus), 335 (in Ovis aries).

lanceolata Schrank, 1790, 123 (in Cyprinus brama); 1803, 213–214.—Dies., 1850a, 341 (syn. of D. globiporum).

lanceolata (*bramæ*) [Schrank, 1790, 123] of Rud., 1809a, 364 (syn. of Dist. globiporum), see lanceolata 1790.

laureata (Zed., 1800) Rud., 1802a, 86–87; 1809a, 413 (to Dist.).—Blainv., 1824a, 518 (type of lobostome).—Dies., 1850a, 380 (to Dist.).—Lamarck, 1816, 184.—Nord., 1840, 621 (includes F. farionis).

lincaris Rud., 1793a, 29 (in Phasianus gallus; Greifswald, Oct.); 1802a, 85–86; 1809a, 414.—Dies., 1850a, 380 (to Dist.).—Hass., 1896a, 2, 3 (to Crossodera).

lincaris Mueller, 1774, 67–68 (in foveis palustribus sylvarum).—Schrank, 1803, 172–173 (to Plan.).

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linearis longa Linn., ——.—Pallas, 1781a, 95 (in Cyprinus variis).

lineata Mueller, 1774, 60–61 (in littore maris Balthici).

loliginis Gmelin, 1790a, 3059 [or Fabricius, ——, 328] (includes F. barbata Linn., probably this renamed).—Baird, 1853a, 115 (=Tetrabothriorhynchus barbatus).—Dies., 1850a, 573 (syn. of Tetraboth. migratorius).—Rud., 1810a, 385.

longicollis Abildg. [1788], 34, pl. 151, fig. A, 1–2 (in Coluber natrix).—Dies., 1850a, 348 (syn. of D. naja).—Olfers, 1816, 46.—Rud., 1819a, 377 (syn. of D. naja).

longicollis Rud., 1809a, 380 (syn. of Dist. tereticolle), based on Bloch, 1782a, 6 (syn. Fasc. lucii in Esox lucius).—Ben., 1858a, 1861a, 100 (to D. ter.).—Dies., 1850a, 358 (syn. of D. ter.).—Nord., 1840, 619 (syn. D. ter., F. lucii).—Lamarck, 1816, 183.—Sramek, 1901, 105.

longicollis Frœlich, 1791, 73–75, pl. 3, figs. 9–11 (in Cyprinus carpio).—Dies., 1850a, 341 (syn. of Dist. globiporum).—Harz, 1881c, 11 (to Dist.).—Looss, 1894a, 41 (syn. of D. gl.), 49 (e. p. syn. of D. isoporum); 1902m, 763 (and D. gl.).—Rud., 1809a, 365 (syn. of D. gl.); 1814a, 103.—Stiles, 1901, 168.

longicollis (*carpionis*), see longicollis (Frœlich).

lucii Mueller, 1776, 224 (in Lucius, esoph. and stomach); 1779a, 67–68, pl. 30, fig. 7, in Esox lucius; 1780, 136; 1784, 115, pl. 78, figs. 6–8; ——, vol. 1, 33–34, pl. 30, fig. 7 (ventric. of Esox lucius); ——, vol. 2, 52–33, pl. 78, figs. 6–8; 1780, 203.—Baird, 1853a, 53 (=D. tereticolle).—Ben., 1858a, 1861a, 100 (syn. of D. ter.).—Bloch, 1779a, 537, pl. 14, figs. 1–4; 1782a, 6–7.—Bosc, 1802a, v. 1, 274.—Bruguière, 1791a, pl. 79, figs. 20–23.—Crep., 1837, 316.—Dies., 1850a, 358 (syn. of D. ter.).—Gmelin, 1790a, 3058.—Harz, 1881c, 5 (to Dist.).—Herbst, 1787a, 32, pl. 4, figs. 1–4.—Jurine, 1823a, 145–153, figs. 1–5; 1824a, 489–497, figs. 1–5; 1830a, 784–785.—Knoch, 1862, 19.—Looss, 1894a, 5 (syn. of D. ter.).—Nord., 1840, 619 (syn. of F. longicollis).—Rud., 1809a, 379.—Schrank, 1788, 18.—Sramek, 1901, 105.

lucioperæ Mueller, 1776, 223; 1779a, 64, pl. 30, fig. 2; 1788, vol. 1, 32, fig. 30, fig. 2 (int. Perca lucioperca).—Baird, 1853a, 56 (=D. nodulosum).—Bosc, 1802a, v. 1, 273.—Bruguière, 1791a, pl. 79, fig. 13.—Dies., 1850a, 380 (syn. of D. nod.).—Gmelin, 1790a, 3057.—Herbst, 1787a, 33.—Looss, 1894a, 33 (syn. of D. nod.).—Nord., 1840, 621 (syn. of F. nodulosa).—Rud., 1809a, 410.—Schrank, 1788, 18; 1790, 123.—Sramek, 1901, 106 (syn. of D. nod.).—Stiles & Hass., 1898a, 84, 85 (syn. of D. nod.).

lucipetum (Rud., 1819) Blainv., 1828a, 585.

macrostoma Rud., 1803a, 26–27 (in Nachtigall); 1809a, 386.—Blainv., 1828, 585.—Dies., 1850a, 361 (to Dist.).—Poche, 1907, 125.—Stiles, 1901, 192.—Stiles & Hass., 1898a, 95, 96 (type of Urogonimus).

maculosa Rud., 1802a, 67–68 (F. hirundinis Frœlich renamed) (in Hirundo apus, H. rustica, H. urbica); 1809a, 374.—Braun, 1902b, 46 (to Plagiorchis).—Dies., 1850a, 349 (to Dist.).

magna (Bassi, 1875) Stiles, 1894c, 172–178, 225–243, pls. 1–11, figs. 4–7, a–g; 1895l, 277–280; 1894w, 91–94; 1896i, 202; 1898a, 22, 27, 29, 42, 49, 51, 52, 53, 54, 55, 140, 141, 142, figs. 28–35; 1902, 222.—Bossuat, 1902, v. 6 (2), 192.—Looss, 1899b, 557; 1902m, 783.—Pratt, 1898, 357, 365.—Rail., 1893a, 356.—Salmon & Stiles, 1901, 454.—Smith, F. C., 1881, 14 (Dist. crassum).—Sons., 1889, 275 (syn. Dist. magnum); 1896, 114, 115; 1896, 303.—Ward, 1895, 238 (in cattle), 252–253, 254–255, pl. 2, figs. 14–16 (in cattle and deer) (includes: D. hepaticum p. p., F. hepatica p. p., F. carnosa, F. americana, D. texanicum), 332 (in Bos taurus), 335 (in Ovis aries), 338 (in Equus caballus); 1903, 866 (includes: F. americana, F. carnosa, Cladocœlium giganteum p. p., D. crassum p. p., D. texanicum), 867.—Also reported for Boselaphus tragocamelus, Cervus canadensis, C. dama, C. elaphus, C. virginianus, C. unicolor.

maimonis Blainv., 1828a, 586, 2 figs. (in Simia maimon).—Dies., 1850a, 374 (syn. of D. laciniatum).

marmorosa Mueller, 1774, 71 (in fossis aquaticis rara).—Schrank, 1803, 175 (to Plan.).

melis Schrank, 1788, 17 (in Dachs, Meles), based on Gœze, 1782a, 176, pl. 14, figs. 9–10; 1803, 214.—Bosc, 1802a, v. 1, 268.—Dies., 1850a, 381 (syn. of D. trigonocephalum).—Gmelin, 1790a, 3053.—Rud., 1793a, 26–27; 1809a, 415.

mesostoma Rud., 1803a, 28 (in Krametsvogel); 1809a, 388 to Dist.—Braun, 1902b, 126.—Dies., 1850a, 361.

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militaris Rud., 1803a, 30–31 (in Scolopax arquata); 1809a, 421 (to Dist.).—Ben., 1858a, 1861a, 86 (to Dist.).—Dies., 1850a, 384 (to Dist.).

milvi Gmelin, 1790a, 3054 (in Milvus).—Bosc., 1802a, v. 1, 269.—Dies., 1850a, 385 (syn. of D. echinocephalum).—Rud., 1809a, 429 (syn. of D. falconis milvi).

muris hepatica Rœderer, 1762, 537–539 (Mus musculus; Germany).—Braun, 1894.—Luehe, 1905, 146 (syn. of Cysticercus fasciolaris).—Stiles, 1906, 43.—Stiles & Stevenson, 1905a, 10.—Tschudi, 1837, 67.

mutabilis Schrank, 1803, 210–211.

nana Rud., 1802b, 68–69 (in Scolopax gallinula; Greifswald, July); 1809a, 377, to Dist.—Dies., 1850a, 350 (to Dist.).—Braun, 1902b, 47 (to Plagiorchis).

nigra Mueller, 1774, 54 (in rivo; free form).—Herbst, 1787a, 36.—Johnston, 1865, 9.—Schrank, 1803, 165 (to Plan.).

nodulosa Frœlich, 1791, 76–80 (includes F. percæ cernuæ Mueller (in Perca cernua, P. fluviatilis).—Dies., 1850a, 380 (to Dist.).—Looss, 1894a, 33 (to Dist.).—Nord., 1840, 621 (includes F. luciopercæ, F. percæ cernuæ).—Lamarck, 1816, 184.—Rud., 1809a, 411.—Schrank, 1803, 213.—Type of Crossodera 1845 and Bunodera 1896.

obscura Mueller, 1774, 65 (in piscinis).—Schrank, 1803, 171–172 (to Plan.).

ocreata Rud., 1802b, 79–81 (F. halecis Gmelin, renamed) (in Clupea harengus); 1809a, 329, 398 (to Dist.).—Dies., 1850a, 372 (to Dist.).—Mont., 1891, 15 (to Apoblema); 1891, 496, 499.—Type of Pronopyge 1899.

ocreata Gœze, 1782a, 182, pl. 15, figs. 6–7 (in Maulwurf).—Dies., 1850a, 326 (to Monost.) (in Talpa europæa).—Nord., 1840, 624 (to Monost.).—Rud., 1809a, 329 (to Monost.).

ocularis Moquin-Tandon, 1860, 347 (includes Dist. ophthalmobium, Dicrocœlium oculi humani); 1861; 1862.—R. Bl., 1888a, 630.—Stiles, 1902, 29.—Ward, 1895, 328 (in Homo).

oculis Moquin-Tandon (Hulme's), 1861, 375, for F. ocularis.—Stiles, 1902, 28, 29.

ovata Rud., 1803a, 25–26 (in Corvus frugilegus); 1809a, 357 (to Dist.).—Braun, 1901, 13; 1902b, 69, 77 (p. p. syn. of Prosthogonimus cuneatus; pp. syn. of P. cuneatus).—Dies., 1850a, 335 (to Dist.).—Hass., 1896a, 2, 3 (to Cephalogonimus).—Looss, 1899b, 629 (type of Prymnoprion).

percæ Gmelin, 1790a, 3057 (= F. percæ cernuæ renamed) (in Perca cernua).—Bosc, 1802a, v. 1, 273.—Baird, 1853a, 56 (syn. of Dist. nodulosum).—Bruguière, 1791a, pl. 79, fig. 14.—Rud., 1809a, 411 (syn. of D. nod.).

percæ cernuæ Mueller, 1776, 224; 1779a, 65, pl. 30, fig. 1 [sic. = fig. 3]; 1788, v. 1, 32, pl. 30, fig. 3 (in Perca cernua).—Dies., 1850a, 380 (syn. of D. nodulosum).—Herbst, 1787a, 33.—Looss, 1894a, 33 (syn. of D. nod.).—Nord., 1840, 621 (syn. of F. nod.).—Rud., 1809a, 410.—Schrank, 1788, 18.

percina Schrank, 1790, 123 (in Perca asper, P. vulgaris); 1803, 213.—Dies., 1850a, 380 (syn. of D. nodulosum).—Looss, 1894a, 33 (syn. of D. nod.).—Rud., 1809a, 411.

picta Rud., 1802, 64–65 (F. vespertilionis renamed) (in Fledermaus); 1809a, 427 (renamed lima).—Dies., 1850a, 387 (syn. of D. lima).—Kolenati, 1857, 12.

platellæ Bosc, 1802a, v. 1, 273 (see platessæ).

platessæ Mueller, 1784, 114, pl. 78, figs. 1–5; 1788, v. 2, 52, pl. 78, figs. 1–5.—Bruguière, 1791a, 79, figs. 26–27.—Cobbold, 1858b, 160.—Dies., 1850a, 352 (syn. of D. areolatum).—Gmelin, 1790a, 3057.—Rud., 1809a, 401 (renamed D. areol.).

polymorpha Rud., 1802b, 70–72 (F. anguillæ Gmelin, renamed) (in Aal); 1809a, 363 to Dist. Dies., 1850a, 340 (to Dist.).

punctata Mueller, 1774, 57 (in pratis inundatis primovere, free form).—Pallas, 1774, 23, pl. 1, fig. 14 a b (in aq., Belgii).—Schrank, 1803, 166 (to Plan.).

punctum (Zed., 1800) Blainv., 1828a, 586.

pusilla (Braun, 1790) Gmelin, 1790a, 3055.—Bosc, 1802a, v. 1, 269.—Dies., 1850a, 360, to Dist.—Rud., 1802b, 75–76; 1809a, 385 (to Dist.).

putorii Gmelin, 1790a, 3053 (in Mustela putorius). Bosc, 1802a, v. 1, 268.—Dies., 1850a, 381 (syn. of Dist. trigonocephalum).—Rud., 1793a, 25–26; 1809a, 415.—Schrank, 1788, 17. Stoss., 1892, 29 (syn. of Echinost. trigonocephalum).

quadrangularis Pallas, 1774, 20–21, pl. 1, figs. 12a-c (in fossis; Hagæ comitum).

FASCIOLA—Continued.

radiata Mueller, 1774, 66 (in aquis sylvestribus, rara).

ranæ Gmelin, 1790a, 3055 (for Plan. subclavata Gœze, 1782a, 178, which includes Fasc. subclavata, ore sessili Pallas pro parte; t. h. [based on Gœze] frog, Rana, intestine; Europe).—Bosc, 1802a, v. 1, 270.—Rud., 1809a, 348 (syn. of Amphist. subclavatum).

ranæ Frœlich, 1791, 69–73, pl. 3, figs. 7–8 (in Rana temporaria L.).—Baird, 1853a, 52 (syn. of Dist. clavigerum).—Braun, 1892a, 768.—Dies., 1850a, 352 (syn. of D. clavigerum).—Looss, 1894a, 84, 85, 88 (syn. of D. endolobum); 1905, 21, 22 (syn. D. endol.).—Olfers, 1816, 45.—Rud., 1809a, 348 (syn. of Amphist. subclavatum).

reticulata (Wright, 1879) Looss, 1899b, 557.

revoluta Frœlich, 1802, 58–60, pl. 2, figs. 6–7 (in Anas boschas; Europe).—Looss, 1899b, 680 (syn. of Echinost. echinatum).—Rud., 1814a, 102 (sub Dist. echinatum).

rosea Mueller, 1774, 58 (in sinu Dröbachiensi).

rostrata Mueller, 1774, 65–66 (in paludosis, primo vere annorum).—Johnston, 1865, 15.—Schrank, 1803, 170–171 (to Plan.).

rubra Mueller, 1774, 59 (Fucorum frequens).—To Plan. in 1776.

saccata Gœze, 1782a, 221, based on Sack-Egel of Merrem, 1781, 169, pl. 1, figs. 3–7.—Braun, 1894a, 4.—Raum, 1883, 20.—Stiles, 1906, 43.—Stiles & Stevenson, 1905a, 10 (syn. of Cysticercus fasciolaris).—Tschudi, 1837, 67 (syn. of Cyst. fasc.).—Zed., 1803a, 406 (syn. of Cyst. tæniæformis).

salamandræ Frœlich, 1789, 119–121, pl. 4, figs. 8–10 (in black salamander, Salamandra atra).—Bosc, 1802a, v. 1, 270.—Dies., 1850a, 356 (syn. of Dist. crassicolle).—Gmelin, 1790a, 3055.—Rud., 1809a, 378.—Stiles, 1901, 197.

salmonis Mueller of Gœze, 1782a, 173.—Luehe, 1901, 399 (? syn. of Hemiurus crenatus (Rud.) Luehe), 401.—Odhn., 1905, 353.

scabra Mueller, 1784a, 31–32, pl. 51, figs. 1–8, in Gadus barbatus; ——, v. 2, 14, pl. 51, figs. 1–8 (in ventric. Gadus barbatus).—Bosc, 1802a, v. 1, 272.—Bruguière, 1791a, pl. 79, figs. 28–32, v–z.—Dies., 1850a, 393.—Gmelin, 1790a, 3056.—Knoch, 1894a, 3.—Mont., 1891, 507.—Odhn., 1905, 349 (=F. serrulata Mueller), 353.—Rud., 1809a, 406 (to Dist.).

scombri pelamidis Tilesius, in Rud., 1809a, 391 (syn. of Dist. clavatum), 437.—Buttel-Reepen, 1902, 166.—Cobbold, 1879b, 461.—Dies., 1850a, 366 (syn. of D. clav.).

scorpii Mueller, 1776, 223; 1779a, 64, pl. 30, fig. 1; 1788, v. 1, 32, pl.30, fig. 1 (in Cottus scorpius, Blennius viviparus, int.).—Bosc, 1802a, v. 1, 273.—Bruguière, 1791a, 79, fig. 12.—Dies., 1850a, 366 (syn. of D. granulum).—Gmelin, 1790a, 3057.—Herbst, 1787a, 33.—Lamarck, 1816, 183–184.—Nord., 1840, 620 (syn. D. gran.).—Rud., 1809a, 394 (syn. of D. gran.).—Schrank, 1788, 18.

serrulata Mueller, 1776, see Gœze, 1782a, 173.—Luehe, 1901, 399 (? syn. of Hemiurus crenatus (Rud.) Luehe), 400, 401.—Odhn., 1905, 349 (=F. scabra Mueller), 353.

solæiformis Blainv., 1828a, 585 (for soleæformis Rud., 1809).

squali grisei Risso, ——, 38, see Dies., 1850a, 347 (syn. of D. veliporum).

stagnalis Mueller, 1774, 53 (in stagnis; free form).—To Plan. in 1776.

strigata Mueller, 1774, 66–67 (in aquis paludosis).—To Plan. in 1776.

strigis (Schrank, 1788) Gmelin, 1790a, 3055.—Baird, 1853a, 47 (=Holost. macrocephalum).—Bosc, 1802a, v. 1, 269.—Dies., 1850a, 312 (syn. of Holost. variabile).—Linst., 1905, 191.—Nord., 1840, 626 (syn. of Amphist. macrocephalum).—Rud., 1809a, 340 (syn. of Amphist. macro.).—Type of Strigea, Amphist., Holost.

strigis stridulæ Braun, in Rud., 1809a, 347.

subclavata (Gœze, 1782) Schrank, 1788a, 19; 1803, 211–212.—Dies., 1850a, 318 (of Schrank to Diplodiscus), 368 (of Pallas syn. of Dist. cylindraceum).—Looss, 1894a, 64 (Pallas e. p. syn. of Dist. cygnoides); 1905, 21, 22.—Rud., 1809a, 348 (of Schrank syn. of Amphist. subclavatum), 393 (of Pallas syn. of Dist. cylindraceum).

subclavata ore sessile Pallas, 1760 or 1761, 271 (polynomial), in lungs of Rana and liver of Hungarian sheep.

FASCIOLA—Continued.

tentaculata Mueller, 1774, 63–64 (in aquis palustribus).—To Plan.

tereticollis Rud., 1802b, 74–75 (F. lucii Mueller, renamed); 1809a, 380.—Ben., 1858a, 1861a, 100 (to Dist.).—[Blainv., 1828a, 585.]—Dies., 1850a, 358.—Looss, 1894a, 5; 1899b, 570 (type of Azygia).—Sramek, 1901, 105 (to Dist.).

terrestris Mueller, 1774, 68–69 (in asseribus muscisque humidis).—Claus, 1885a, 262 (to Rhynchodesmus, Geoplanidæ).—Metchnikov, 1866b, 433–447; 1866, 22 pp. (? syn. of Geodesmus bilineatus).

tetragona Mueller, 1774, 69 (in stagno ac foveis aquæ purioris nec vulgaris).—To Plan. in 1776.

tincæ Modeer, 1790, 127 (in Cyprinus tinca).—Dies., 1850a, 395 (syn. of D. perlatum). Looss, 1894a, 24 (syn. of D. perl.).—Rud., 1809a, 365 (syn. of D. globiporum).—Stiles & Hass., 1898a, 92 (syn. of D. perlatum).

torva Mueller, 1774, 62–63 (in aquis).—Johnston, 1865a, 11.—Schrank, 1803, 167–169 (to Plan.).

trachea Montagu, 1811a, 194–198, pl. 7, fig. 4 (in poultry).—Hass., 1896a, 3, 6 (syn. of Syngamus trachealis); 1896b, 1, 2.—Rail., 1893a, 453 (syn. of Syng. trach.).

transversalis Rud., 1802a, 69 (in Cobitis fossilis); 1809a, 362; 1819a, 95 (Greifswald and Berlin).—Dies., 1850a, 339.—Odhn., 1901, 505.

tremellaris Mueller, 1774, 72 (in mari Balthico, Hafniam alluente).—Johnston, 1865a, 6.—To Plan. in 1776.

trigonocephala Rud., 1802b, 87–88 (F. melis Schrank, renamed) (in Schweinigel).—Dies., 1850a, 382.—Lamarck, 1816, 184.—Nord., 1840, 621–622 (includes D. echinatum, Echinost. echinatum, E. ferox, F. echinata, F. ferox, Plan. putorii).—Stoss., 1892, 29 (to Echinost.).

truitta Bosc, 1802a, v. 1, 274 (for truttæ, Frœlich).

truncata Mueller, 1806, 35, pl. 151, fig. B, 1–3 (in Perca lucioperca).—Rud., 1814a, 105.

truttæ (intestinalis) Rœderer, 1762, June 19, 537 (in forelle).—Bosc, 1802a, v. 1, 274.—Dies., 1850a, 583 (syn. of Ligula nodosa).—Luehe, 1904, 146; 1905, 334 (=Echinorhynchus).—Rud., 1809a, 262 (? syn. of Echinorhynchus fusiformis); 1810a, 18 (syn. of Lig. nod.).—Schrank, 1803, 209.

truttæ Frœlich, 1789, 126, 127, pl. 4, figs. 16–17 (in Salmo trutta; Europe).—Dies., 1850a, 380 (syn. of Dist. laureatum).—Gmelin, 1790a, 3058.—Rud., 1809a, 413 (syn. of D. laur.); 1814a, 102 (syn. of D. farionis Frœlich).

umblæ Fabricius, 1780a, 329; 1794, 26–29, pl. 3, figs. 6–8 D (in Salmo umbla; Greenland).—Bosc, 1802a, v. 1, 274.—Dies., 1850a, 343 (syn. of Dist. seriale).—Gmelin, 1790a, 3058.—Herbst, 1787a, 36.—Rud., 1809a, 368, 369 (renamed Dist. seriale, in Salmo alpinus).

uncinata Dies., 1850a, 412 (syn. of Polyst. integerrimum) lapsus for uncinulata.—Stoss., 1898, 10.

uncinulata (Braun, 1790) Gmelin, 1790a, 3056.—Bosc, 1802a, v. 1, 270.—Nord., 1840, 594 (syn. of Linguatula integerrima).—Rud., 1809a, 452 (syn. of Polyst. integerrimum).

upupæ Schrank, 1790, 123 (in Upupa epops, rectum); 1803, 211.—Dies., 1850a, 351 (syn. of Dist. involutum).—Rud., 1809a, 377 (syn. of D. involutum).

varica Mueller, 1784a, 93–94, pl. 72, figs. 8–11 (in Salmo salar); 1788, v. 2, 43, pl. 72, figs. 8–11.—Bosc, 1802a, v. 1, 273.—Bruguière, 1791a, pl. 80, figs. 5–8.—Dies., 1850a, 368 (to Dist.).—Gmelin, 1790a, 3057.—Lamarck, 1816, 184.—Levin., 1881a, 54 (to Dist.).—Nord., 1840, 620 (to Dist.).—Odhn., 1905, 360 (to Derogenes).—Rud., 1802b, 81; 1809a, 396 (to Dist.).

venarum (Treutler, 1793) Schrank, 1803, 210.

ventricosa Pallas, 1774, 17–18, pl. 1, figs. 9–10 (host not given; Amboyna).—Baird, 1853a, 59 (to Hirudinella).—Buttel-Reepen, 1900a, 586; 1902, 166, 172, pl. 6, fig. 2.—Cobbold, 1879b, 459, 460.—Darr, 1902, 664, 665, 666.—Dies., 1859c, 431.—Herbst, 1787a, 36.

verrucosa Frœlich, 1789, 112–115, pl. 4, figs. 5–9 (in weidender Gänse) Ben., 1858a, 1861a, 78 (to Monost.).—Dies., 1839c, 234; 1850a, 411 (syn. of Notocotyle triseriale).—Hass., 1896a, 3 (to Notocotyle).—Mont., 1892, 26.—Nord., 1840, 602 (syn. of Nocotylus triserialis), 624 (to Monost.).—Odhn., 1905, 366 (type of Catatropis).—Rail., 1893a, 340 (to Notocotyle).—Rud., 1809a, 331.—Schrank, 1803, 209.

FASCIOLA—Continued.

vespertilionis Mueller, 1784a, 95–96, pl. 72, figs. 12–16; 1788b, v. 2, 43–44, pl. 72, figs. 12–16 (in Vespertilio auritus).—Bosc, 1802a, v. 1, 268–269.—Braun, 1900, 387.—Bruguière, 1791a, pl. 80, figs. 9–11.—Dies., 1850a, 387 (syn. of D. lima).—Gmelin, 1790a, 3053.—Kolenati, 1857, 12.—Lamouroux, 1824a, 563.—Rud., 1793a, 27–28; 1809a, 427.—Schrank, 1788, 18.

viridis Mueller, 1774, 59–60 (in radicibus fucorum; Greenland).

vulpis Gmelin, 1790a, 3053 (in Canis vulpes; Europe).—Brand., 1888a, 9, 60 (syn. Hemist. alatum Dies.).—Dies., 1850a, 308 (syn. of Hemist. alatum).—Rud., 1793a, 30–32; 1809a, 402 (syn. of D. alatum).

FASCIOLARIA Rafinesque, 1815, 151, fam. name, includes Anthostoma, Caryophylleus Zed., Fascinia, Fasciola L., Hexathyridia Treutler, Linguatula L., Lingula L., Polystoma Zed., Unicola Raf.

FASCIOLARIA Encyclop. Metrop. or Universal Dict. of Knowledge, Lond., v. 18, 141 (as generic name) [not Fasciolaria Lamarck, 1799, mollusk].—Dies., 1850a, 577 (misprint for Fasciola).—Stiles & Hass., 1898a, 89 (syn. of Fasciola).

fimbriata (Gœze, 1782) Dies., 1850a, 577 (misprint for Fasciola) (syn. of Caryophyllæus mutabilis).—Sramek, 1901, 114 (syn. of C. mut.).

hepatica (Linn., 1758) Encycl. Metropolitana, 1845, v. 18, 141 (type of Fasc.).—Stiles, 1898a, 29.—Ward, 1895, 246.

ranæ (Gmelin, 1790) Nord., 1840, 627 (syn. of Amphist. subclavatum) (for Fasciola).

FASCIOLIASIS, BIBLIOGRAPHY OF: Huber, 1890f, 77–79.

———, GEOGRAPHIC DISTRIBUTION: Biermer, 1863a, 381–395 (Switzerland); 1895a, 253 (Switzerland).—Chardin, 1876a, 277–314 (Orleansville).

———, *in various animals:* Burke, 1886b, 470; 1887a, 47.—Hass., 1894a, 162–167 (epizootics).

———, *in cattle:* Bilhuber, 1791a (and sheep).—Lucet, 1890b, 548–549 (lungs); 1890c, 549–550 (spleen).—Stiles, 1902b, 64–69, figs. 93–98, 126–134, figs. 99–109, 204–209, figs. 110–113, 312–319, figs. 114–118, 373–379, figs. 119–122, 558–559, figs. 123–124.

———, HEPATIC, IN MAN: Askanazy, 1900b, 491, 496 (Bostroem's 1883a case); 1901, 75 (chronic choleportitis and fibrinous periportitis).—Biermer, 1863a, 381–395 (Switzerland); 1865a, 253 (Switzerland).—R. Bl., 1891p, 604–606, 616 [see correction in R. Bl., 1894g].—Bossuat, 1902 v. 6 (2), 187.—Bostroem, 1883a, 557–577, 1 fig.—Chabert, 1852a, 173–174 [a tapeworm]; 1852c, 174; 1852d, 195–196.—Chester, 1887a, 359–360 (must have been contracted in Dorsetshire, England).—Duffek, 1902a, 772–775; 1902b, 826; 1903a, 30; 1903, Aug. 15, 843.—Garcia Sola, 1884a, 129–135, fig. 5.—Huber, 1896, 574–575 (22 cases in 100 years).—Humble & Lush, 1881a, 75–76 (England).—Leichtenstern, 1885b, 502.—Prunac, 1878, 1147–1149; 1879, v. 27, 99–109; 1879, July 27, 429–434.—Sagarra, 1890, v. 14, 505–512; 1891, Apr. 18, 510–511.—Staff., 1905, Apr. 11, 694 (Canada).—Wyss, 1868, v. 9, 172–177, pl. 3, figs. 1–2.

———, HEPATIC, SHEEP: Bass, 1893a, 93.—Cristini, (1845a).—[Dowling, 1894a, 232.]—[Dun, 1880a, 550–556; 1881a, 141–204.]—[Dupuy, 1838a, 511–523.]—Flemming, 1881a, 87–93; (1881b).—[Fonssagrives, 1868a, 299–315, figs. 1–2.]—[Friedberger, 1880a.]—[Frommann, 1688b, 245–252.]—General, (1883a), 86–87.—Halse, 1887a, 62 pp.; 1887b, 65; 1888a, 147–149.—Hutcheon, 1895h, 350–354, figs. 1–4.—King, 1836a, 95–101.—Morton, 1839, 735–738.—Waldinger, 1818.—Wernicke, 1888, 673 (Buenos Ayres).

———, PATHOLOGY AND LOCATION: Bossuat, 1902, 187.

———, *symptoms:* Khouri, 1904, 78, 79, 80, 81 (halzoun).

———, *treatment:* Bennett, 1876a, 677–680 (salt and potash: Australia).—[Hellier, 1895k, 635.]—[Hutcheon, 1891m, 86–87; 1891n, 140–141, sheep); 1893b, 23 (creolin)]; 1897b, 100 (sheep): [1897g, 142–146].—Syme, 1895, Dec. 26, 680–681.

FASCIOLIDÆ Rail., 1895, 338.—R. Bl., 1895, 729–730.—Braun, 1900b, 387–391 (of Chiroptera); 1900c, 24–32 (Clinost.); 1900d, 27–29 (Rhopalias); 1900f, 387–391 (of Chiroptera); 1900g, 250; 1901i, 55–58 (nomenclature); 1902a, 120 (nomenclature); 1902b, 1–162, figs. 1–99 (of birds); 1902c, 442–444; 1903, 3. ed., 147, 445; 1905, 59–60.—Darr, 1902a, 644–701, pls. 33–35, figs. 1–34; 1902b, 735–736; 1902, 58 pp.; 1905, July, 55–56.—Looss, 1901, 91; 1901, 191, 196; 1902m,

FASCIOLIDÆ—Continued.

838.—Luehe, 1901, 486–488.—MacCallum, 1899, 707.—Pratt, 1902, 887, 893 (key) (includes Anisocœlinæ, Bunoderinæ, Centrocestinæ, Cotylogoniminæ, Echinostominæ, Fasciolinæ, Haplometrinæ, Omphalometrinæ, Opisthorchiinæ, Philophthalminæ, Plagiorchiinæ, Psilostominæ, Reniferinæ, Anaporrhutinæ, Brachycœliinæ, Cephalogoniminæ, Dicrocœliinæ, Clinostominæ, Gorgoderinæ, Harmostominæ, Microphallinæ, Pleurogenetinæ, Hermiurinæ, Syncœliinæ, Telorchiinæ, Urogoniminæ, Zoogoninæ).—Roger, 1901, 94.—Shipley, 1905, v. 6, 4.—Stiles, 1898a, 22, 27, 28; 1901, 191, 192, 195; 1904i, 10–11, 12–45, figs. (of man).—Stiles & Hass., 1898a, 81–89 (type Fasciola; superspecific inventory).—Ward, 1903, 863, 864, 865.

FASCIOLINÆ Stiles & Hass., 1898a, 86, 90, 95, 96 (subf. of Fasciolidæ).—Looss, 1899b, 543, 556, 560, 561, 626; 1901, 196; 1902m, 839.—Luehe, 1900, 562; 1901, 486; 1901, 175.—Odhn., 1905, 339, 344, 346, 347.—Pratt, 1902, 887 (includes Campula, Fasc., Fasciolopsis; related genera: Paragonimus, Pleorchis).—Stiles, 1898a, 22, 28.—Ward, 1903, 867.

FASCIOLOPIS Odhn., 1902, 581, misprint for Fasciolopsis.

buski (R. Bl., 1888) Odhn., 1902, 581.

FASCIOLOPSIS Looss, 1899b, Dec., 557, 561 (tld. buskii), includes crassa Busk, jacksoni Cobbold.—Braun, 1903, 3. ed., 153; 1906, 158.—Odhn., 1905, 339, 344, 346.—Pratt, 1902, 887, 893.—Stiles, 1904i, 39–40.—Ward, 1903, 866.

1902: Fasciolopis Odhn., 1902, 581, misprint.

buski (R. Bl., 1888) Odhn., 1902, 573–581, figs. 1–3. See buskii.

buskii (Lankester, 1857) Stiles, 1901, 1542; 1904i, 41–42, figs. 63–66 (in Homo).—Braun, 1903, 3. ed., 153–154, fig. 99 (in Homo); 1906, 159, fig. 90 (buski) (syns. Dist. buski and D. crassum).—Conyngham, 1904 (IX, 17), 663.—Looss, 1905, 110, fig. 16; 1907, Feb. 1, 123 (buski) (from Hongkong).—Moore & Ferril, 1905a, Sept. 30, 1002–1003, figs. 1–7; 1905b, 8 pp., figs. 1–7 (in U. S.).—Ward, 1903, 864, 867; 1903, 704.

crassa (Cobbold, 1860) Looss, 1899b, 557.

jacksoni (Cobbold, 1869) Looss, 1899b, 557.

rathouisi (Poir., 1887) Ward, 1903, 864, 867; 1903, 704.—Looss, 1905, 111, fig. 17.—Stiles, 1904i, 42–43, fig. 67.

FELLODISTOMUM Staff., 1904, May 3, 486 (m. incisum).—Odhn., 1905, 310.

incisum (Rud., 1809) Staff., 1904, 486 (in Anarrhichas lupus).

FESTUCARIA Schrank, 1788, Gattung 9, 16–17 (type by elimination anatis, see Luehe, 1901; also type by first species rule); 1803, 185.—Blainv., 1824a, 512 ("genre adopté de Schrank pour le Distoma trigonocephalum, qui paraît n'être qu'une espèce de monostome"), 518 ("ce sont les monostomes cylindriques et à bouche terminale de M. Rudolphi").—Brand., 1888a, 8.—Braun, 1893a, 884, 894.—Cuv., 1817, 40.—Dies., 1850a, 307 (syn. of Hemist.), 312 (syn. of Holost.), 319 (syn. of Monost.), 400 (of Zed., syn. of Amphist.), 411 (syn. of Notocotyle).—Hémont, 1827, 9.—Knoch, 1862, 30.—Lamouroux, 1822a, 194.—Looss, 1901, 193; 1902m, 746, 755.—Luehe, 1901p, 174, 175 (type anatis).—Rafinesque, 1815, 151 (renamed Monostomeus).—Rud., 1801a, 50, 54; 1809a, 21.

alata (Gœze, 1782) Schrank, 1790, 118; 1803, 208–209.—Brand., 1888a, 60 (to Hemist.).—Dies., 1850a, 308 (to Hemist.).—Lamouroux, 1822a, 194.—Rud., 1809a, 402, 403 (to Dist.).

anatis Schrank, 1788, 16, based on Gœze, 1782a, 174, pl. 13, figs. 8–11 (in Enten).—Dies., 1850a, 383 (syn. of D. echinatum).—Luehe, 1901p, 175 (type of Festucaria by elimination), species unidentifiable, possibly Echinost. echinatum.—Rud., 1809a, 418.

boschadis Schrank, 1790, 122–123 (in Anas boschas sylvestris, A. b. dom.); 1796, 332, pl. 5, figs. 16–17; 1803, 207–208.—Dies., 1850a, 383 (syn. of D. echinatum).—Looss, 1899b, 680.—Rud., 1809a, 418, 419.

caryophyllacea Rud., 1810a, 353 (misprint for caryophyllina).

caryophyllina Rud., 1802a, 66–67, pl. 1, fig. 3 (in Gasterosteus aculeatus); 1809a, 325.—Dies., 1850a, 328 (to Monost.).—Rail., 1893, 339 (to Monost.).

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secundus Looss, 1907, Feb. 1, 134–136, figs. 3–4 (in mules; Assam).

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1905, 50 (syn. G. polymastos).—Looss, 1896b, 13 (syn. of G. ægyptiacus).—Mégnin, 1880, Aug. 15, 782–784, figs. 1–2 (in horse); 1881, v. 2, 250–252, figs. 2.—Moore, 1897b, 167; 1897a, 183–184 (sonsinoi); 1897c; 1898a, 531.—Poir., 1883, 74 (sonsinoni).—Sons., 1895, 124 (syn. G. polymastos).—Theobald, 1900, 50.—Ward, 1895, 338 (in Equus caballus).

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GASTRODISKUS Schneidemuehl, 1896, 295, 303, for Gastrodiscus.

polymastus Schneidemuehl, 1896, 303, for polymastos.

GASTROTHYLAX Poir., 1883, 76–79; γαστήρ, stomach; θύλαξ, pocket, pouch; [type crumenifer].—Brand., 1891d, 17; 1898a, 193–225, pls. 8–9; 1898, 33 pp.—Braun, 1892a, 576, 663, 696, 699, 715, 720, 721, 739; 1893a, 879, 886, 890, 892, 895, 904, 907, 918; 1893d, 466; 1892, 49.—Darr, 1902, 651.—Fischder., 1901, 370; 1902a, 7, 26–27 (type crumenifer); 1903h, 488, 489, 491, 493, 496, 497, 498, 556 (diagnosis), 557 (type crumenifer), 557–591.—Gamb., 1896a, 73.—Gronkowski, 1902a, 515 (8).—Hoyle, 1890, 539.—Looss, 1894a, 146, 175; 1894, 17, 22, 24; 1896b, 5, 7, 8, 9, 31, 32, 171, 173, 176, 177, 178; 1898a, 459; 1899b, 541; 1902m, 638, 676.—Mont., 1888a, 7, 9, 12, 15, 52, 91, 103; 1892, Oct. 7, 214 (gen. of Amphistominæ) (Gastrotylax); 1893, 27.—Pratt, 1902, 887, 892.—Shipley, 1905, v. 6 (1), 8.—Sons., 1895, 184, 185, 186.—Ssinitzin, 1906, 688.—Stiles, 1898a, 24.

1892: Gastrotylax Mont., 1892, 7 Oct., 214, misprint.

ægyptiacus Looss, 1898a, 459, apparently lapsus for gregarius.

cobboldi Fischder., 1901, 372 (for cobboldii); 1902a, 31, 32, 33 (in Palonia frontalis, Java; Bos kerabau, Ceylon; B. taurus, China); 1903h, 542, 575, 579–583, figs. M, 63–66 (from Ceylon in Bos kerabau, from China in Bos taurus), 585, 586, 587, 588, 589, 591; 1904, 459, 463.

cobboldii Poir., 1883, 77–79, pl. 2, fig. 3 (in Palonia frontalis; Java).—Braun, 1892a, 568, 739; 1893a, 873, 907.—Fischder., 1901, 372; 1903h, 575, 579 (syn. of G. cobboldi).—Sons., 1895, 185.—Stiles, 1898a, 24, 67, 69, 139, fig. 63.—Also reported for Bos frontalis.

compressus Brand., 1898a, 197, 219–220, 222 (5, 27–28), pl. 9, figs. 9–11 (in Bos indicus; Vien. Mus.); 1898, 219–220.—Fischder., 1901, 371; 1902a, 28 (in Bos taurus indicus); 1903h, 560, 563–565, figs. 48–49 (in Bos indicus), 567.

crumenifer (Crep., 1847) Otto, 1896, 95–97, figs. 3, 16 (for G. crumeniferum).—Bettend., 1897a, 38; 1897, 342.—Brand., 1898a, 195, 197, 199, 201, 204, 216–219, 220, 221 (3, 5, 7, 9, 12, 24–27), pl. 9, figs. 1–8.—Fischder., 1901, 371; 1902a, 25, 27–28, 30 (in Bos taurus indicus, Calcutta; Bos kerabau, Ceylon); 1903h, 557 (type), 557–563, 564, 566, 567, 568, 570, 571, 572, 574, figs. H, 44–47 (in Bos zebu, B. kerabau).—Linst., 1906, 175 (in Bos bubalus).—Stiles, 1898a, 24, 67, 68, 69, 140, figs. 57–62.

crumeniferum (Crep., 1847) Poir., 1883, 77.—Braun, 1893a, 907.—Fischder., 1901, 371; 1903h, 557–563, figs. H, 44–47, 563, 564, 566, 567, 568, 570, 571, 572, 574 (syn. of G. crumenifer) (in Bos zebu, B. kerabau).—Linst., 1906, 175 (in Bos bubalus).—Rail., 1903a, 378.—Sons., 1896, 311.—Stiles, 1898a, 67.—Ward, 1895, 332 (in Bos taurus).

elongatum Poir., 1883, 76–77, pl. 2, fig. 2 (in Palonia frontalis; Java).—Braun, 1892a, 739; 1893a, 873, 907.—Fischder., 1903h, 574, 575 (syn. of G. elongatus) (in P. front.; Java).—Mont., 1888a, 7.—Sons., 1895, 185.—Stiles, 1898a, 24, 67, 70, 139, fig. 64.

elongatus [Poir., 1883, 73–79 (in Palonia frontalis; Java)].—Brand., 1898a, 197, 198, 204, 223–225 (5, 6, 31–33), pl. 8, figs. 1–14 (in Anoa depressicornis; Zool. Gart., Berlin).—Fischder., 1901, 372; 1902a, 30–31 (in P. front., Java; Anoa depr., Bos sp., Africa; Bos taurus, China); 1903h, 451, 512, 542 (in Bos taurus, Canton Fu-mui, China), 574–579, 580, 581, 587, figs. L, 59–62 (in P. front., Bos kerabau, Anoa depr.); 1904, 463.—Gronkowski, 1902a, 520 (13).—Mont., 1888a, 7.

GASTROTHYLAX—Continued.

gregarius Looss, 1896b, 5–13, 170–177, pl. 1, figs. 1–3, pl. 11, fig. 116, pl. 12, figs. 119–121 (in Buffle; Alexandria, Egypt); 1898, 459; 1902m, 638.—Bettend., 1897a, 38; 1897, 342.—Brand., 1898a, 197, 198, 199, 222–223 (5, 6, 7, 30–31), pl. 9, figs. 12–16.—Fischder., 1901, 371; 1902a, 28 (in Egyptische Buffel); 1903b, 533; 1903h, 565–566, 584.—Kowal., 1898h, 158 (55).—Otto, 1896, 89–94, figs. 1–2, 11, 14, 15; 1896, 10–13.—Rossbach, 1906, 401.—Sons., 1896, 298, 311.—Stiles, 1898a, 24, 67, 71, 139, figs. 65, 66.

mancupatus Fischder., 1901, 371 (in African cattle); 1902a, 31–32, 33 (in Bos taurus; E. Africa); 1903h, 566, 584, 588, 589, 590, 591, figs. 67–71 (in Bos taurus, Dinka; Denjarinder, Afrika; Bos taurus, Africa, Nossi-Bé).

minutus Fischder., 1901, 372 (in Antilope sp., Tragelaphus scriptus, Kamerun); 1902a, 33–34; 1903h, 588–591, fig. N; 1904, 463.

spatiosus Brand., 1898a, 197, 220–221 (5, 28–29), pl. 8, figs. 15–16 (in Bos taurus, Dschidda, Arabian coast of Red Sea).—Fischder., 1901, 371; 1902a, 29, 31 (in B. taurus, Dschidda); 1903h, 566–570, 571, 581, 583 (in B. taurus), 584, 585, 586, figs. 50–54.

synethes Fischder., 1901, 371 (in Bos kerabau); 1902a, 29–30, 31 (in B. ker.; Ceylon); 1903h, 496, 539, 570–574, 575, 577, 578, 579, 580, 581, 584, 585, 586, figs. 55–58, J. K. (in B. ker.; Ceylon).

GASTROTYLAX Mont., 1892, Oct. 7, 214 (gen. of Amphistominæ) (for Gastrothylax).

GENARCHES Looss, 1902m, 732 (Progonus Looss, renamed; type mülleri).—Odhn., 1905, 364, 365, 366.

mülleri (Levin., 1881) [Looss, 1902m, 732] Odhn., 1905, 363, 365–366, pl. 4, figs. 8–9.

GIRODACTILIDÆ Sons., 1890, 175, for Gyrodactylidæ.

GIRODACTYLIDÆ Mont., 1888, 8, 13, 15, for Gyrodactylidæ.

GIRODACTYLUS Mont., 1888, 83, for Gyrodactylus.

GLAPHYROSTOMIUM Pratt, 1902a, 889, misprint for Glaphyrostomum.

GLAPHYROSTOMUM Braun, 1901g, 942 (tod. adhærens); 1902b, 129.—Pratt, 1902a, 889 (Glaphyrostomium), 907.

1902: Glaphyrostomium Pratt, 1902a, 889, misprint.

adhærens Braun, 1901g, 942 (in Mycothera sp., Gallinula kioloides Puch.; Brazil); 1902b, 130, 133.

propinquum Braun, 1901g, 942 (in Dendrocalaptes scandens; Brazil); 1902b, 132–133.

GLENOCERCARIA Dies., 1858d, 244 (type?). [See p. 385.]

flava (La Valette, 1855) Dies., 1858d, 244–245 (includes Cerc. ephemera Sieb., Histrionella eph. Sieb., Cerc. flava La Valette (in Planorbis corneus; Berlin, Heidelberg); 1858e, 326, 327 (to Monost.)—Linst., 1873, 1 (young of Monost. flavum Mehlis).—See Typhlocœlum 1902 (type).

tophocerca (Fil., 1857) Dies., 1858d, 245 (in Paludina impura; Turin).

melanoglena (Dies., 1855) Dies., 1858d, 245 (in salt water).

GLOSSIDIUM Looss, 1899b, 591–592, 594 (tod. pedatum); ἡ γλῶσσα, tongue.—Braun, 1902b, 55. Heymann, 1905, 93.—Odhn., 1902, 40, 42.—Pratt, 1902, 888 (related to Plagiorchiinæ), 899.

pedatum Looss, 1899b, 592, 705–706, fig. 27 (in Bagrus bayad, B. docmac; Cairo).—Luehe, 1900, 561.

GLOSSOCOTYLE Ben. & Hesse, 1863; 1864, 96, 102 (m. alosæ).—Braun, 1890a, 414, 477, 516, 517, 522, 546.—Cerf., 1895h, 918, 920; 1896, 514, 515.—Mont., 1888, 11, 16, 86, 89, 99; 1903, 336 (syn. of Octobothrium).—Tasch., 1879, 239.

alosæ Ben. & Hesse, 1863, 1864, 102–103, pl. 9, figs. 11–18 (in Alosa vulgaris).—Braun, 1890a, 408. Tasch., 1879, 244 (to Octobothrium).

fintæ Mont., 1888, 13.

GLYPHICEPHALUS Looss, 1901l, 620–621 (tod. solidus); 1902m, 570–571 (type solidus), 576, 583, 584, 586, 589, 591, 593, 594, 596, 599, 603, 609, 610, 611, 612, 616 (diagnosis). Pratt, 1902, 890, 909.

crassus Looss, 1901l, 568, 620 (in Thalassochelys corticata; Egypt); 1902m, 575 (to Epibathra as type), 876.

lobatus Looss, 1901l, 619 (in Chelone mydas; Egypt); 1902m, 416, 417, 573–575, *576, 596,* 876, 877, pl. 26, figs. 81–82, pl. 27, fig. 91.

GLYPHICEPHALUS—Continued.

soludus Looss, 1901l, 7. Nov., 619 (in Chelone mydas; Egypt); 1902m, 571–573, 574, 587, 591, 616, 876, 877, 888, pl. 26, figs. 79, 80, pl. 27, figs. 92, 93, pl. 32, fig. 178.

GLYPTHELMINS Staff., 1905, Apr. 11, 686–687 (m. quieta); γλυπτός, carved; ἕλμινς, worm.

quieta (Staff., 1900) Staff., 1905, Apr. 11, 686 (in Hyla pickeringii, Rana catesbiana, R. virescens; Canada) (syn. Opisthioglyphe endoloba Duj. of Staff., 1900, 403).

GORGODERA Looss, 1899b, 551, 605–606 (tod. cygnoides); γοργός, motile; ἡ δέρη, neck; 1901b, 202; 1901l, 557, 558; 1902m, 478, 480 (includes: cygnoides, amplicava, simplex), 785, 797, 844, 848, 850, 851, 854, 856, 857, 858, 859, 860, fig. 1, 862 (Gorgoderinæ, Gorgoderidæ).—Braun, 1901b, 9.—Odhn., 1902, 65.—Osborn, 1903, 257.—Pratt, 1902, 888, 901.—Ssinitzin, 1906, 685.

amplicava Looss, 1899b, 606, 607 ("D. cygnoides var. A" of Bensley, 1897, renamed); 1901b, 202, 209; 1902m, 480, 798, 837, 844, 854, 857.—Staff., 1902, 412, 419–421 (syn. D. cygnoides var. A of Bensley); 1905, Apr. 11, 687 (in urinary bladder of American frogs and toads).

attenuata Staff., 1902, 418–419 (in Rana catesbiana, R. virescens; Canada).—1905, to Gorgoderina.

cygnoides (Zed., 1800) Looss, 1899b, 606; 1901b, 202, 209; 1902m, 444 (Cerc. macrocerca), 480, 797, 798, 837, 844, 851, 854, 857, 862.—Kowal., 1902d, (9) 27 (Cerc. macrocerca in Cyclas cornea).—Luehe, 1901, 54.—Osborn, 1903, 257.—Ssinitzin, 1905, 33 (of Looss syn. of G. loossi).—Staff., 1905, Apr. 11, 687 (in urinary bladder of American frogs and toads).

loossi Ssinitzin, 1905, 33–34, pl. 3, figs. 30–31 (G. cygnoides of Looss, renamed); 1906, 682.

opaca Staff., 1902, 416–417 (in Bufo lentiginosus: America).

pagenstecheri Ssinitzin, 1905, 34–36, pl. 2, figs. 21–27 (cygnoides of Pag., renamed); 1906, 682, 683 [=Dist. cygnoides Zed. of Pag.].

simplex Looss, 1899b, 606, 607 (D. cygnoides var. B of Bensley, 1897, renamed); 1901b, 202, 209; 1902m, 480, 798, 844, 851 (type of Gorgoderina), 863.—Staff., 1902, 412, 417–418 (in Rana catesbiana; America).

translucida Staff., 1902, 413–416 (in Bufo lentiginosus, Rana virescens; America).—Osborn, 1903, 256, 257, 258.

varsoviensis Ssinitzin, 1905, 36–37, pl. 1, fig. 1, pl. 3, figs. 32–34; 1906, 682 (in frogs; Warschau).

vitelliloba (Olss., 1876) Ssinitzin, 1906, 682.

GORGODERIDÆ Looss, 1901, 558; 1902m, 485, 785, 810, 824, 843–866, 844 (diagnosis), 857 (includes Gorgoderinæ, Anaporrhutinæ).—Ssinitzin, 1906, 682 (of frogs).

GORGODERINA Looss, 1902m, 851 (tod. simplex), 857 (Gorgoderidæ, Gorgoderinæ), 858, 859, 860, 862[1], fig. 2.—Ssinitzin, 1906, 685 (in fish).—Staff., 1905, Apr. 11, 687.

attenuata (Staff., 1902) Staff., 1905, Apr. 11, 687 (American toads and frogs).

opaca (Staff., 1902) Staff., 1905, Apr. 11, 687 (in American frogs and toads).

simplex (Looss, 1899) Looss, 1902m, 857, 862, 863.—Staff., 1905, Apr. 11, 687 (American frogs and toads).

translucida (Staff., 1902) Staff., 1905, Apr. 11, 687 (in American frogs and toads).

vitelliloba (Olss., 1876) Looss, 1902m, 857, as doubtful member of genus.—Ssinitzin, 1905, 37, pl. 1, fig. 2, pl. 3, figs. 35–37; 1906, 685.

GORGODERINÆ Looss, 1899b, 604; 1901b, 202; 1901l, 558; 1902m, 478, 480, 485, 797, 844, 857 (includes: Gorgodera, Gorgoderina, Phyllodist., Catoptroides), 863 (diagnosis).—Braun, 1901b, 9.—Luehe, 1901, 488.—Odhn., 1902, 65, 67.—Pratt, 1902, 888 (Phyllodist., Gorgodera).

GRUBEA Dies., 1858c, 315, 385 (m. cochlear); 1859c, 444 (syn. Pleurocotylus Gerv. & Ben.).—Braun, 1890a, 518.—Mont., 1888, 84.—Tasch., 1879, 248 (syn. of Pleurocotyle).

cochlear Dies., 1858c, 385 (in Scomber scombrus).—Hoyle, 1890, 539.—Tasch., 1878, 575; 1879, 248 (syn. of Pleurocotyle scombri).

scombri (Grube, 1855) Ben. & Hesse, 1864, 100 (to Pleurocotyle).

(GYMNOCEPHALA) Leidy, 1877, 201 (as subg. of Dist.) [not Gymnocephalus Bloch, Schneider, 1801, fish; Geoffry, 1809, birds]. Apparently for Cerc. (Gymnocephala) Dies., 1858, 246.

ascoidea Leidy, 1877, 201 (in Planorbis parvus).

(GYMNOCEPHALA) Dies., 1858d, 246, (type?) as subg. of Cercaria.

agilis (Fil., 1857).—Dies., 1858d, 248–249 (in Lymnæus stagnalis; Turin).

brunnea (Dies., 1850) Dies., 1858d, 247 (in Lymnæus stagnalis).—See Dist. echinatum.

coronata (Fil., 1855) Dies., 1858d, 249, 250.

fallax (Dies., 1850) Dies., 1858d, 247–248, 262 (in Lymnæus stagnalis, Paludina vivipara).—See Dist. militare.

minuta (Nitzsch, 1817) Dies., 1858d, 246 (in various fresh-water mollusks; Halle).

proxima (Lespés, 1857) Dies., 1858d, 249–250.

renalis (Fil., 1855) Dies., 1858d, 265–266 (in Helix adspersa; Turin).

sagittata [Lespés, 1857] Dies., 1858d, 249 (in Buccinum (Nassa) reticulatum).

setifera (Mueller, 1850) Dies., 1858d, 250–251 (in sea; Triest).

tuberculata (Fil., 1857) Dies., 1858d, 248 (in Paludina impura; Turin).

GYMNOCEPHALÆ Dies., 1858d, 246, see Gymnocephala.

GYMNOPHALLINÆ Odhn., 1905, 314.

GYMNOPHALLUS Odhn., 1900, 12–23 (tod. deliciosus); 1905, 312, 313, 314.—Looss, 1901b, 200; 1902m, 839.—Luehe, 1900, 505, 506; 1901, 488; 1904, 79–82.—Marshall & Gilbert, 1905, 479.—Pratt, 1902, 889, 902.—Ward, 1901, 177.

bursicola Odhn., 1900, 14, 20–21, 22, fig. 4 (in Somateria mollissima: west coast of Sweden); 1905, 312, 313 (includes Leveithodendrium somateriæ e. p. of Jameson).

choledochus Odhn., 1900, 14, 18–19, 22, fig. 3 (in Vulpanser tadorna; loc.?); 1905, 312, 313–314 (in Somateria mollissima at Eisfjord, W. Spitzbergen, and S. spectabilis at Franz-Joseph's Fjord, Greenland).

deliciosus (Olss., 1893) Odhn., 1900, 14–17, 18, 19, 20, 21, 22, figs. 1–2 (in Larus argentatus, L. canus, L. fuscus); 1905, 311 (in Larus glaucus, L. marinus).

micropharyngeus (Luehe, 1898) Odhn., 1900, 14, 17, 22.—Luehe, 1900, 505; 1901, 57.

somateriæ (Levin., 1881) Odhn., 1900, 14, 19–20, 21, 22; 1905, 311–313, pl. 2, fig. 8 (in Somateria mollissima, S. spectabilis).

GYNÆCOPHORA Weinland, 1858, 87 (family name); 1859, 281.—Stiles & Hass., 1898a, 90, 94.

GYNÆCOPHORUS Dies., 1858c, 312, 356 (type hæmatobius).—Braun, 1893a, 880, 885, 894, 912; 1903, 3. ed., 168 (syn. of Schistosomum).—Cobbold, 1879b, 39; 1885a, 498 (syn. of Bilharzia).—Dunglison, 1893, 502.—Hoyle, 1890, 539 (= Bilharzia).—Huber, 1896a, 580 (syn. of Bilharzia).—Leuck., 1863, 617.—Mont., 1888, 92.—Rail., 1893a, 371.—Simon, 1897, 99.—Stiles & Hass., 1898a, 90, 93, 94.—Stoss., 1892, 4, 5.—Ward, 1895, 253.

bovis (Sons., 1876) Rail., 1893, 375.—Dolley.—Stiles, 1898a, 60.

crassus (Sons., 1888) Stoss., 1892, 6 (syn. Bilharzia bovis) (in Bos taurus ægyptus, Ovis aries).—Rail., 1893a, 375.—Stiles, 1898a, 60.—Ward, 1895, 332 (in B. taurus), 335 (in O. aries).

hæmatobius (Bilharz, 1853) Dies., 1858c, 356–357 (in Homo); 1859c, 480.—Aitken, 1866, 804, 840; 1872, 205 (to Bilharzia).—R. Bl., 1888a, 636.—Cobbold, 1866a, 6.—Harley, 1864a, 62 (to Dist.).—Huber, 1894, 298.—Rail., 1892, 161–164 (embryo); 1893a, 371.—Stiles, 1898a, 58.—Stoss., 1892, 5–6 (in Homo: Egitto, Nubia, Tunisia, Natale, Capo, Costa d' oro, Arabia; Cercopithecus fuliginosus in Africa).—Ward, 1895, 253, 256, 328 (in Homo), fig. 7; 1903, 872.

magnus (Cobbold, 1859) Stoss., 1892, 6 (syn. Bilharzia magna) (in Cercopithecus fuliginosus; Africa).—Braun, 1901e, 311.

GYRADACTYLIDÆ Mont., 1888a, 66, 107, see Gyrodactylidæ.

GYROCOTYLE Dies., 1850a, 408 (m. rugosa); 1859a, 492; 1859c, 447.—Mont., 1889c, 228–230 (Amphiptyches G. & W.); 1890b, 327–329; 1896, 153. [Cestodaria.]

rugosa Dies., 1850a, 408 (in Antilope pyarga; Port Natal); 1859a, 492 (in Mactra edulis; Valparaiso); 1859c, 447.

urna (Grube & Wag., 1852) Mont., 1896, 151.

GYRODACTYLE Moul., 1856a, 10, for Gyrodactylus.

GYRODACTYLEÆ Cerf., 1899a, 452.

GYRODACTYLIDÆ Cobbold, 1877f, 326; 1879b, 4.—R. Bl., 1888a, 541 (embraced in Polystomiens).—Braun, 1890a, 463, 465, 469, 511, 516, 517, 519, 523, 533, 538, 542; 1890b, 127; 1893a, 890.—Cerf., 1899a, 452.—Gamb., 1896a, 53, 61, 73.—Goto, 1899, 291.—Jackson, 1888, 642, 654 (includes: Gyrodactylus, Dactylogyrus, Calceost., etc.).—Maclaren, 1904, 583, 597, 598, 599, 600, 601.—Mont., 1888a, 8, 13, 15 (Girodactylidæ); 1889, 116; 1891, 108, 109; 1905, 80.—Par. & Perugia, 1889, 745.—Scott, 1901, 141.—Sons., 1890, 175 (Girodactilidæ).—See also next entry.

GYRODACTYLIDÆ "Ben. & Hesse, 1863," ——.—Hoyle, 1890, 539 (includes: Gyrodactylus, Dactylogyrus, Tetraonchus, Diplectanum, Calceost., Sphyranura).—Mont., 1888, 7, 8, 10, 11, 14, 20, 24, 37, 66, 70, 86, 88, 90, 101, 107, 108; 1903, 336 (raised from subf. to family rank; subf.: Gyrodactylinæ (Gyrodactylus, Dactylogyrus); Tetraonchinæ (Tetraonchus = Ancyrocephalus = Amphibdella = Dactylodiscus); Diplectaninæ (Diplectanum); 1892, Oct. 7, 213 (fam. of Eterocotylea, includes subf. Calceostominæ, Gyrodactylinæ).—Par. & Perugia, 1890, 8.—Pratt, 1900a, 646, 653 (includes: Gyrodactylus, Dactylogyrus, Tetraonchus, Diplectanum, Calceost., Amphibdella, Dactylodiscus, Fridericianella, Anoplodiscus).—Stoss., 1898, 16–17.—Tasch., 1879, 69; 1879, 235, 237, 238, 260.—See also foregoing entry.

GYRODACTYLIDEA "Ben."—Olss., 1893, 6.

GYRODACTYLIDES Tasch., 1879, 235.—Mont., 1888, 86.

GYRODACTYLINÆ Mont.,1892, Oct. 7, 213 (subf. of Gyrodactylidæ); 1903, 336 (f. Gyrodactylidæ); 1905, 65, 80.—Braun, 1893a, 890.—Gamb., 1896, 73.—St.-Remy, 1898, 523, 564.

GYRODACTYLUS Nord., 1832a, 105–106 [type by elimination elegans]; 1840, 603.—Ben., 1858a, 1861a, 11, 63–66, 171, 177, 297.—Ben. & Hesse, 1864, 121.—Biehringer, 1884, 19, 23.—Braun, 1883a, 57; 1889i, 440; 1889k, 622; 1890a, 412, 416, 436, 438, 443, 444, 445, 448, 450, 451, 452, 468, 470, 478, 486, 492, 503, 508, 511, 515, 516, 517, 523, 542, 543; 1892a, 813; 1893a, 888, 889, 890; 1893b, 179, 184, 187.—Burm., 1856a, 251.—Carus, 1863, 478.—Crep., 1838, 84; 1839, 301.—Dies., 1850a, 290, 432, 433 (syn. of Dactylogyrus), 650, 651; 1858c, 314, 374–375; 1859c, 423, 439.—Duj., 1845a, 480–481.—Fraip., 1880c, 442.—Gamb., 1896, 55, 61, 63, 73.—Goldb., 1855, 20.—Haswell, 1892b, 150; 1893c, 114.—Hoyle, 1890, 539.—Jackson, 1888, 643, 646, 648, 654.—Kath., 1894a, 125–164; 1894b, 125–164; 1895a, 431; 1899a, 328–329.—Leuck., 1863, 48, 51, 489; 1879, 58, 62.—Looss, 1892a, 72.—Maclaren, 1904, 586, 587, 598, 599, 600.—Metschnikoff, 1869a, 61–65 (embryology).—Mont., 1888, 10, 13, 14, 53, 63, 70, 71, 72, 73, 76, 84, 86, 95, 101, 107, 108; 1889, 114; 1891, 109, 111; 1892, Oct. 7, 186, 213 (g. of Gyrodactylinæ); 1903, 336 (subf.: Gyrodactylinæ).—Odhn., 1900, 65.—Plehn, 1905, 28–30 (treatment with ammonia).—Pratt, 1900a, 646, 654, 657, fig. 43, 661.—Roth, 1904, 60 61 (treatment).—St. Remy, 1898, 524, 565.—Sieb., 1839, 163; (1849) v. 1 (4), 347–363.—Tasch., 1879, 69; 1879, 233, 258, 260 (syn. Dactylogyrus), 261 (syn. of Dactylogyrus), 263 (of Wedl, syn. of Tetraonchus).—Wagener, 1857, 25, 26, 49, 50, 76.—Wallenstedt, 1847, 7.

anchoratus Duj., 1845a, 480–481, pl. 8, fig. j (t. h. "carpe").—Bradley, 1861a, 257.—Dies., 1850a, 432.—Kath., 1894a, 155, 156.—Tasch., 1879, 261 (syn. of Dactylogyrus auriculatus).—Wagener, 1857, 49.

auricularis Wedl, 1857, 254, 258, 259, 274, 277, pl. 3, figs. 27–31 [uses auricularis and auriculatus]. in Cyprinus carpio.—Dies., 1858c, 376 (syn. of Dactylogyrus anchoratus).—Kath., 1894a, 157.—Tasch., 1879, 261 (syn. of Dact. auriculatus).

auriculatus Nord., 1832a, 108–109, pl. 10, figs. 4–9 (t. h. Cyprinus brama); 1840, 546, 603–604.—Ben., 1858a, 1861a, 64, 66–67, pl. 7, figs. 9–11 (in C. br.).—Braun, 1891d, 421.—Crep., 1838, 84, 85, 86, 87; 1839, 301.—Dies., 1850a, 432 (of Duj., 1845a, 480, syn. of G. dujardinianus), 433 (of Nord., type of Dactylogyrus); 1859c, 440 (of Ben., 1858, 66, syn. of Dact. duj.).—Duj., 1845a, 480, pl. 8, fig. H.—Kath., 1894a, 155, 156.—Mont., 1888, 10.—Sieb., 1835, 70.—Tasch., 1879, 260 (of Duj. syn. of Dact. duj.), 261 (of Nord., to Dactylogyrus).—Wagener, 1857, 49, 50. Wedl, 1857, 258–274, pl. 3, figs. 27–31.

cochlea Wedl, 1857, 258–274, pl. 3, figs. 32–37 (in Esox lucius).—Cobbold, 1862m, 38; 1879b, 466.—Dies., 1858c, 380 (syn. of Tetraonchus monenteron).—Kath., 1894a, 157.

GYRODACTYLUS—Continued.

crassiusculus Wedl, 1857, 258–274, pl. 4, figs. 38–40 (in Lucioperca sandra).—Cobbold, 1862m, 38; 1879b, 466.—Dies., 1858e, 381 (syn. of Tetraonchus unguiculatus).—Kath., 1894a, 157.—Tasch., 1879, 263 (syn. of Tetr. ung.).

cruciatus Wedl, 1857, 258–274, pl. 4, figs. 46–47 (in Cobitis fossilis).—Dies., 1858e, 381 (to Tetraonchus).—Kath., 1894a, 157.—Tasch., 1879, 264 (to Tetr.).

dujardinianus Dies., 1850a, 432 (auriculatus of Duj., 1845a, 480, pl., fig. H, renamed) (in Cyprinus carpio, Leuciscus rutilus); 1858e, 376 (to Dactylogyrus).—Kath., 1894a, 156.—Kroyer, 1852–53a, 1224 (in Leuc. rut.).

elegans Nord., 1832a, 106–108, pl. 10, fig. 1–3 (t. h. Cyprinus brama); 1840, 603.—Ben., 1858a, 1861a, 11, 64, 67–68, 223, pl. 7, fig. 12 (in Cyp. br.).—Ben. & Hesse, 1864, 121.—Bradley, 1861b, 209–210 (on stickle-back in Hampstead ponds).—Braun, 1883a, 57, 71; 1890a, 417, 425, 426, 438, 454, 455, 508, 543, 549, 550, 551; 1893b, 179.—Cobbold, 1862m, 35–39; 1879b, 464, 465, 466, fig. 79.—Crep., 1838, 84, 85, 87; 1839a, 301.—Dies., 1850a, 432, 649, 651; 1852, 417, v. 13, 51–54; 1858e, 375 (in Cyp. carpio, Abramis brama, Gasterosteus aculeatus, G. pungitius, Phoxinus lævis, Cobitis barbatula); 1859c, 439–440.—Duj., 1845a, 480.—Gamb., 1896, 61, fig. 29.—Houghton, 1862a, 77 (in Shropshire).—Hoyle, 1890, 539, 540, fig. 3–G.—Jackson, 1888, 650.—Janicki, 1903a, 241–245, figs. 1–4 (egg segmentation); 1903b, 380.—Kath., 1894a, 127, 129, 130, 132, 133, 134, 140, 141, 144, 150, 155, 156, 157, 158, pl. 7, figs. 1, 2, 5, 6; 1899a, 328; 1904a, 519–550, figs. A–K, 1–26 (development); 1904b, 444–445; 1905a (I, 31), 18–19.—Kholodk., 1899a, 148.—Kowal., 1902d, 23 (5) (in Cyp. carpio); 1904, 328–329; 1904, 10, (25) (in Cyp. carpio; Galicia); 1905a, 18–19.—Kroyer, 1838–40a, 592, 593; 1852–53a, 1225, 1226 (in Phoxinus aphya L., Cob. barb. L., Gast. acul., G. pungitius).—Leuck., 1863a, 489.—Levin., 1881a, 79.—Mont., 1888a, 8, 70; 1891, 111; 1892, Oct. 7, 186.—Odhn., 1905, 372.—Olss., 1893, 6.—Pavesi, 1881, 616.—St.-Remy, 1898, 565–566.—Schneidmuehl, 1896, 303.—Sieb., 1839, 164; 1849, 347.—Sramek, 1901, 95, 110, fig. 65 (in Abramis brama).—Tasch., 1879, 260–261 (in Cyp. carpio, Abramis brama, Gast. acul., G. pungitius, Phoxinus lævis, Cob. barb.).—Wagener, 1857, 49, 50, 51–54, 57, 60, 63, 64, 76; 1860, 768–793, pls. 17–18; 1861, v. 1, 196–212 (reported also for Abramis vimba, Cyclopterus lumpus, Esox lucius, Gobius minutus, Leuciscus phoxinus).

falcatus Wedl, 1857, 258–274, pl. 4, figs. 48–50 (in Cyprinus sp.).—Dies., 1858e, 377 (to Dactylogyrus).—Kath., 1894a, 157.—Tasch., 1879, 261 (to Dact.).

gracilis Kath., 1894a, 129, 131, 139, 141, 143, 147, 150, 157, 158–159, pl. 7, figs. 4, 7, (in Cobitis fossilis, Cyprinus carpio, Gobius fluviatilis, Leuciscus erythrophthalmus, L. rutilus) [=G. elegans of Ben.]—Odhn., 1905, 372.—St.-Remy, 1898, 566.

grænlandicus Levin., 1881a, 78–79, pl. 3, figs. 5–6 (in Cottus scorpius; Egedesminde).—Odhn., 1905, 372.—Pratt, 1900, 372; 1900, 657, 661, fig. 43.

medius Kath., 1894a, 129, 131, 137, 141, 143, 147, 150, 158, pl. 7, figs. 3, 8, pl. 8, figs. 9–16, pl. 9, figs. 17–24 (in Cobitis fossilis, Cyprinus carpio); 1899a, 328.—Odhn., 1905, 372.—St.-Remy, 1898, 566.

mollis Wedl, 1857, 258–274, 272, pl. 4, fig. 51 (in Cyprinus carpio).—Dies., 1858e, 379 (to Dactylogyrus).—Kath., 1894a, 157.—Tasch., 1879, 262 (to Dact.).

species Ben., 1870, 27, pl. 3, fig. 14, see Dactylogyrus benedeni.—St.-Remy, 1898, 566, 567.

species Ben., 1870, 64, pl. 3, fig. 13.

tenuis Wedl, 1857, 258–274, 270, 278, pl. 4, figs. 41–45 (in Perca fluviatilis).—Cobbold, 1862m, 38, 39.—Dies., 1858e, 379 (to Dactylogyrus).—Kath., 1894a, 157.—Tasch., 1879b, 262 (to Dact.).

GYRODAKTILIDÆ Schneidemuehl, 1896, 296, for Gyrodactylidæ.

HÆMATOBIUM shortened form of Dist. hæmatobium Dunglison, 1893, 506; also Reichenback's term for a blood corpuscle.—Billings, 1890, 612.—Danilewsky, 1890c, 753 [=Plasmodium].

equi Burke, 1882, 320, fig. 1 (a blood filaria), 322, fig. 2 (egg of fluke).

HÆMATOLŒCHUS Looss, 1899b, 600–601, 602, 603 (tod. variegatus Looss, 1899) [not Hæmatolœcha Stål, 1874, hemipteron] (renamed: Pneumonœces Looss, 1902m, 732) *αἱματολοιχός*, blood sucking; 1902m, 732, 839.—Klein, 1905, 64. Luehe, 1900, 557, 561. Odhn., 1902, 41. Ofenheim, 1900, 156, 164, *182*.—Pratt, 1902, 888, 900; 1903, 37.—Staff., 1902, 418; 1902, 725; 1902, *895 912*; 1905, Apr. 11 (=Pneumonœces). Stiles, 1901r, 189.—Stiles & Hass., *1901d*, 20.

HÆMATOLŒCHUS—Continued.

asper Looss, 1899b, 601, 603–604 (separated from variegatus).—Luehe, 1902, 238.—Staff., 1902, 896.

breviplexus Staff., 1902, 901, 904–905, pl. 33, fig. 2 (in Rana catesbiana, R. virescens; Canada).

longiplexus Staff., 1902, 901–903, pl. 33, fig. 1 (in Rana catesbiana; Canada).

medioplexus Staff., 1902, 901, 908–910, pl. 33, fig. 5 (in Bufo lentiginosus, Rana virescens; Canada).

similigenus Stiles & Hass., 1902d, 20 (H. similis [Distoma simile] renamed).

similiplexus Staff., 1902, 901, 907–908, pl. 33, fig. 4 (in Rana virescens Kalm, Bufo lentiginosus Shaw; Canada).—Seely, 1906, 252.

similis Looss, 1899b, 601, 602 ("Dist. simile Looss, 1899" nec Sons., 1890).—Staff., 1902, 896, 908.—Stiles, 1901, 178.—Stiles & Hass., 1902d, 20 (renamed similigenus).

variegatus (Rud., 1819) Looss, 1899b, 601, 602; 1902m, 429, 732 (type of Pneumonœces).—Luehe, 1900, 556.—Ssinitzin, 1905, 137–140; 1906, 686 (in Calopteryx virgo; Warschau).—Staff., 1902, 896, 906.—Stiles, 1901, 178.—Stoss., 1902, 5.

varioplexus Staff., 1902, 901, 906, pl. 33, fig. 3 (in Rana catesbiana; Canada).

HÆMATOTREPHUS Stoss., 1902, 8, 22–23 (tod. lanceolatus Wedl).

cymbius (Dies., 1850) Stoss., 1902, 27–28 (in Himantopus wilsoni; Brazil).

fasciatus Stoss., 1902, 25, pl. 6, figs. 21, 22 (in Numenius arquatus; locality?).

lanceolatus (Wedl, 1858) Stoss., 1902, 23–24, pl. 5, figs. 17, 18 (in Himantopus candidus; Rome; H. melanopterus).

phaneropsolus Stoss., 1902, 25–26, pl. 6, figs. 23, 24 (in Totanus sp.; Yeddo, Japan).

similis Stoss., 1902, 24, pl. 5, figs. 19, 20, pl. 8, fig. 30 (in Himantopus atropterus; Cairo, Alexandria).

tringæ (Brand, 1892) Stoss., 1902, 26–27, pl. 7, fig. 26 (in Tringa variabilis; Tor, Sinai).

HALICOMETRA Pratt 1902a, 888 (subf., Psilostominæ) 896, for Helicometra.

HALIPEGUS Looss, 1899b, 645–646 (m. ovocaudatus); ἁλίς, enough; πηγός, well fed; 1902m, 839.—Odhn., 1905, 364.—Ofenheim, 1900, 183.—Luehe, 1901, 485.—Pratt, 1902a, 889 (related to Syncœliinæ), 905.

dubius Klein, 1905, 68 (in Coluber olivaceus); 1905, 10.

longispina Klein, 1905, 65–68, pl. 5, fig. 3 (in Rana hexadactyla); 1905, 7–10.

occidualis Staff., 1905, Apr. 11, 687–688 (in Rana clamata Daud., R. catesbiana Shaw; Canada) (syns.: Dist. ovocaudatum of Nickerson 1898, 261, and of Staff., 1900, 409).

ovocaudatus (Vulpian, 1858) Looss, 1899b, 645.—Klein, 1905, 7, 8, 9; 1905, 65.—Luehe, 1900, 507; 1900, 558. 559.—Odhn., 1905, 364.—Ssinitzin, 1905, 140–144; 1906, 686 (in Calopteryx virgo; Warschau); larva is Cerc. cystophora.—Staff., 1904, May 3, 484 (compared with Derogenes varicus (in mouth of frogs) sp. Luehe, 1900, 558–559.—See dubius Klein, 1905.

HALZOUN Khouri, 1904, 78, name of disease, see sub Fascioliasis.

HAPALOMETRA Pratt, 1902, 889, misprint for Hapalotrema.

HAPALOTREMA Looss, 1899b, 656–657 (m. constrictum=mistroides); 1902m, 415, 520, 521, 523, 524, 839.—Braun, 1902b, 23.—Luehe, 1901, 488.—Odhn., 1902, 41, 42.—Ofenheim, 1900, 183.—Pratt, 1902a, 889 (Hapalometra, misprint), 907.

1902: Hapalometra Pratt, 1902a, 889, misprint.

constrictum (Leared, 1862 [nec Mehlis, 1846]) Looss, 1899b, 656, 750–752, figs. 72–75; 1902m, 417, 519–521 (in Thalassochelys corticata in Egypt).

mistroides (Mont., 1876).—Stiles & Hass., 1908, 279.

HAPLOMETRA Looss, 1899b, 599–600 (tod. cylindracea), 601, 602, 603; 1902m, 839.—Luehe, 1900, 557, 561.—Odhn., 1902, 41.—Ofenheim, 1900, 182, 183.—Pratt, 1902, 888, 900.—Staff., 1905, Apr., 11, 691.

cylindracea (Zed., 1800) Looss, 1899b, 600.—Darr, 1902, 663, 678.—Kowal., 1902d, (8) 26; 1904, (9) 24, (in Rana temporaria; Dublany).—Luehe, 1900, 556, 557.

HAPLOMETRINÆ Pratt, 1902a, 888, 900 (includes: Haplometra, Hæmatolœchus, Ostriolum, Macrodera; related genera: Opisthogonimus, Asymphylodora),

HAPLOPORINÆ Looss, 1902, 129–143, 14 figs., distome subf.

HAPLOPORUS Looss, 1902h, 134–135 (tod. benedeni).

benedeni (Stoss., 1887) Looss, 1902h, 135, 136–138, figs. 5–6.

lateralis Looss, 1902h, 138–139, figs. 7–8 (in Mugil auratus, M. chelo).

HAPLORCHIDINÆ Pratt, 1902, 890 (includes: Haplorchis, Galactosomum, Opisthotrema, Cyclocœlum, Notocotylus, Ogmogaster, Stictodora, Mesometra, Monost.).

HAPLORCHIINÆ Looss, 1899b, 671.

HAPLORCHIS Looss, 1899b, 670–671 (tod. pumilio); ἁπλοῦς, single; 1902m, 442, 512.—MacCallum, 1902, 636.—Pratt, 1902, 890, 910.

cahirinus (Looss, 1896) Looss, 1899b, 671, 752–754, fig. 89.

pumilio (Looss, 1896) Looss, 1899b, 671.

HAPLOSPLANCHNUS Looss, 1902i, July 26, 119–122 (m. pachysomus); 1902k; 1903n, 899; 1905h.—Odhn., 1905, 293.

pachysomus (Eysenhardt, 1829) Looss, 1902i, 129.

HAPLOSTOMUM Burm., 1856a, 250 ("Bei den Holostomiden (Acolytea Dies.) ist ausser der Sauggrube, worin sich der Mund befindet, keine zweite Sauggrube am Körper vorhanden.—Diplostomum und Haplostomum mit den davon abgezweigten Formen haben weit von einander getrennte Geschlechtsöffnungen; bei Holostomum stehen sie dicht neben einander").

HARMOSTOMINÆ Looss, 1900, 605.—Pratt, 1902, 889, 907 (includes: Harmost., Ityogonimus, Glaphyrostomum, Scaphiost.).

HARMOSTOMUM Braun, 1899g, 492 (tod. leptostomum; also places here D. spinulosum Hofm., D. opisthotrias Lutz); 1900h, 5, 11, 12, 13; 1901b, 34; 1901c, 338, 342 (syn. Heterolope); 1901, 562, 564, 567; Braun, 1901, 897; 1902b, 114, 115, 116, 120, 122, 125, 135 (syn. Heterolope).—Cohn, 1902, 880.—Looss, 1900, 605 (Marmost., misprint); 1901, 199; 1902m, 813, 839.—Luehe, 1900, 557; 1901, 488.—Odhn., 1902, 42.—Pratt, 1902, 889, 907.—Stiles, 1901, 183, 185.

1899: Heterolope Looss, 1899b, 551, 651–652, 653, 655 (tod. leptostoma) [not Heterolope Franzenau, 1884, protozoon].

1900: Marmostomum Looss, 1900, 605, misprint.

æquans (Looss, 1899) Braun, 1900h, 12; 1901e, 338.

caudale (Rud., 1809) Braun, 1901f, 562; 1902b, 123, 124 (syn. Dist. caryocatactis Zed.) (in Nucifraga caryocatactes).

centrodes Braun, 1901g, 941 (in Tinamus variegatus Lath.; Brazil); 1902b, 120, 121, 122, figs. 73, 74.

fuscatum (Rud., 1819) Braun, 1902b, 114, 115 (in Coturnix communis), 116, 118, 129, fig. 71.

leptostomum (Olss., 1876) [Braun, 1899g, 492]; 1906, 133, fig. 68 (in Helix hortensis).

marsupium Braun, 1901g, 941 (in Perdix rufina Spix; Brazil); 1902b, 118, 121, fig. 72.

mesostomum (Rud., 1803) Braun, 1902b, 128 (syn. D. caudale Rud.).

mordens Braun, 1901g, 941 (in Rallus sp.; Brazil); 1902b, 122, 132, fig. 75.

opisthotrias (Lutz, 1895) Braun [1899g, 492] 1901e, 338–339.

[*spinulosum* (Hofman, 1899) Braun, 1899g, 492.]

HECTOCOTYLUS Cuv., 1829b, 147 (type octopodis).—This supposed worm is not a trematode, but a male mollusk. The name is written in various ways: Hectocotyle, etc.

HELICOMETRA Odhn., 1902, 160–161 (tod. pulchella); 1905, 327, 328.—Stoss., 1903, v. 7 (3), 373–376, 1 fig.; 1904, 199; 1905, Jan. 31, 23; 1905, Jan. 10, 789.

1902: Halicometra Pratt, 1902a, 888, 896, misprint.

fasciata (Rud., 1819) Odhn., 1902, 161, 162.—Stoss., 1903, 373, 375; 1904, 13.

flava Stoss., 1903, 373–376, 1 fig. (in Centropristis hepatus; Triest); 1904, 13.

gobii (Stoss., 1883) Stoss., 1904, 12–13 (in Gobius jozo; Triest).

mutabilis (Stoss., 1902) Stoss., 1903, 375, 376; 1904, 13.—Engler, 1904, 186.—Hollack, 1902a, 868.

pulchella (Rud., 1819) Odhn., 1902, 161–162, fig. 3 (syn. D. labri Stoss.).—Stoss., 1903, 373, 375; 1904, 13.

sinuata (Rud., 1819) Odhn., 1902, 162.—Stoss., 1903, 373, 375; 1904, 13.

HEMISTOMA Cobbold, 1876, 853, for Hemistomum.—Fischder., 1903h, 488.

HEMISTOMEÆ Brand., 1890a, 585.

HEMISTOMIDÆ Brand., 1888a, 58.—Braun, 1893a, 887.—Heider, 1900, 19–22, 4 figs. (Braunina n. g.).

HEMISTOMINÆ Braun, 1893a, 890, 895, 902.—Mont., 1892, Oct. 7, 214 (subf. of Holostomidæ).—Mueh.,1898, 18.—Pratt, 1902, 890 (Hemist.).—Wolf, 1903, 621.

HEMISTOMUM Dies., 1850a, 287, 307–312 (type by inclusion alatum=Alaria vulpis; also type by first species rule) (syns.: Plan. Gœze, Festuc. et Alaria Schrank, Fasc. Gmelin, Strigea Abildg., Dist. et Amphist. Rud., Holost. Nitzsch), 397 [not Hemistomia Crosse, 1872, mollusk]; 1855, 60–61; 1858e, 312, 318–319.—Brand., 1888a, 8, 9, 12, 13, 14, 50, 59; 1892, 505.—Braun, 1892a, 599, 600; 1893a, 872, 879, 887, 890, 894, 895, 900, 902, 917; 1894, 166; 1895b, 132, 136.—Carus, 1863, 479.—Cohn, 1904, 235.—Fischder.,1903h, 488.—Gamb.,1896, 73.—Goldb., 1855, 17.—Johntson, 1904a (in Australian birds).—Hoyle, 1890, 539 (3 sp., 1 in wild cat, 2 in birds).—Looss, 1896b, 13 (sp. of Sons., syn. of Gastrodiscus ægyptiacus).—Mont., 1888, 71, 84, 91; 1891, 105, 109; 1892, Oct. 7, 214 (gen. of Hemistominæ).—Moul., 1856a, 12, 15.—Pratt, 1902, 890, 908.—Rail., 1893a, 381; 1896, 160 (=Conchosomum).—Schneidemuehl, 1896, 295, 303.—Villot, 1878, 19; 1898, 538.—Wolf, 1903, 607.

1876: Hemistoma Cobbold, 1876, 853.

ægyptiaca (Cobbold, 1876) Cobbold, 1876, Dec., 853–854.

alatum (Gœze, 1782) Dies., 1850a, 307–308 (includes Plan. alata Gœze, Festuc. alata Schrank, Fasc. alata Rud., Dist. alatum Zed., Holost. alatum Nitzsch, Fasc. vulpis Gmelin, Alaria vulpis Schrank, Dist. vulpina Abildg.).—Anacker, 1892c, 94.—Baillet, 1866b, 106 (to Holost.).—Brand., 1888a, 16, 60 (syns. Alaria vulpis Scrhank, Dist. alatum Rud., D. vulpina Abildg., Fasc. alata Rud., Festucaria alata Schrank, Fasc. vulpis Schrank, Holost. alatum Nitzsch, Plan. alata Gœze) (in Canis familiaris, C. vulpis, Thoas cancrivorus); 1890a, 568, 569, 587, pl. 40, figs. 1–5.—Braun, 1883b, 25; 1892a, 569, 599; 1893a, 879, 902; 1896b, 3; 1896d, 583; 1897c, ——; 1901e, 336.—Cobbold, 1879b, 432.—Dav., 1877a, 233.—Mol., 1858, 127; 1861, 193.—Mueh., 1898, 18.—Par., 1894, 202, 620, 809, 1050.—Rail., 1893a, 382; 1896, 160 (to Conchosomum).—Ratz, 1898, 397.—Schneidemuehl, 1896, 303.—Sons., 1889, 192 (Emistomum).—Stoss., 1891, 111 (in Vulpes vulgaris).—Ward, 1895, 341 (in Canis familiaris).—Zuern, 1882, 221.—Also reported for Canis azaræ, Canis lagopus, C. lupus, Megalotis cerdo.

attenuatum Linst., 1906, 11–12, pl. 1, fig. 13 (in Buteo vulgaris).

auritum (Duj., 1845) Dies., 1850a, 311–312 (in Strix flammea, Apr., Rhedoni).—Brand., 1888a, 62; 1890a, 589 (in St. flam.).—Braun, 1893a, 902.

clathratum Dies., 1850a, 308 (t. h. Lutra brasiliensis; Matogrosso, Brazil); 1855, 61, pl. 1, figs. 13–15; 1858e, 318, 319.—Brand., 1888a, 60–61; 1890a, 587–588, pl. 40, figs. 6–13 (in L. bras.).—Braun, 1892a, 569, 582, 599, 699; 1893a, 902.—Cobbold, 1879b, 298.—Wolf, 1903, 605, fig. 2.

commutatum Dies., 1850a, 311 (includes "Amphist. pileatum" of Bremser, pl. 8, figs. 28, 29, not of Rud., 1819) (t. h. Sterna caspica; June, M. C. V.).—Brand., 1888a, 62; 1890a, 590 (in S. cas.).—Braun, 1893a, 902.

cordatum Dies., 1850a, 308–309 (t. h. Felis catus ferus; Nov., M. C. V.); 1855, 61, pl. 1, figs. 16–18; 1858e, 319.—Brand., 1888a, 24, 25, 61–62; 1890a, 552, 554, 589, pl. 40, figs. 18, 20 (in Felis catus); 1892, 505.—Braun, 1892a, 569, 579; 1893a, 902.—Cobbold, 1879b, 307.—Heider, 1900, 19, 21.—Schneidemuehl, 1896, 303.—Wolf, 1903, 605, 606, 609, fig. 3.

denticulatum (Rud., 1819) Dies., 1850a, 311 (in Alcedo ispida; Rhedoni).—Brand., 1888a, 62 (in A. isp.; Wien. Mus.); 1890a, 589.—Braun, 1893a, 902.—Villot, 1898, 538, 539, 540, 541, 542 (adult of Diplost. volvens; larva in Phoxinus lævis).—Wolffhuegel, 1900, 9, 18.

ellipticum Brand., 1888a, 59–60, 67 (in Piaya cayana; by Natterer); 1890a, 586, 595.—Braun, 1893a, 902 (Brazil).

excavatum (Rud., 1803) Dies., 1850a, 309–310 (in Ciconia alba, July, Gryphiæ; C. nigra).—Braun, 1893a, 902; 1894, 167.—Brand., 1888a, 62; 1890a, 590 (in Ciconia alba, C. nigra).—Giebel, 1857, 265.—Mueh., 1898, 16, 18.—Also reported for Nycticorax griseus.

grande (Dies., 1850) Brand., 1890a, 576 (syn. of H. macropterum).

intermedium Johnston, 1904, 109–110, pl. 5, figs. 7–10 (in Cygnus atratus Lath.).

HEMISTOMUM—Continued.

kordatum, see cordatum.

macropterum Wien. MS. in Brand., 1888a, 55 (syn. Diplost. grande Dies.); **1890a**, 576, 581.

pedatum Dies., 1850a, 309 (t. h. Didelphis myosurus and D. cancrivorus; Brazil, May, June, Dec.); 1855, 61–62, pl. 1, figs. 19–24; 1858e, 319.—Brand., 1888a, 57, 61 (in Did. cancr., D. my.); 1890a, 584, 588, pl. 40, fig. 14.—Braun, 1892a, 581; 1893a, 880, 902.

pileatum Brand., 1888a, 59, 62, 64 (in Sterna caspica, Larus glaucus, Colymbus arcticus, Mergus merganser) (syn. Holost. erraticum of Linst., 1877c, 188, pl. 13, figs. 18–19); 1890a, 586, 589, 590, 591, pl. 40, fig. 21; 1892, 510.—Braun, 1892a, 582; 1893a, 902.—Kowal., 1904, (8), 23 (in Mergus merganser).—Linst., 1906, 12.—Much., 1898, 18.—Stoss., 1895, 37; 1898, 20.—Wolffhuegel, 1900, 9, 15, 54, 61, 62.—Reported also for Buteo vulgaris, Ciconia alba, Colymbus glacialis, C. septentrionalis, Larus marinus, L. ridibundus, Nyctea nivea, Podiceps cristatus.

podomorphum (Nitzsch, 1819) Dies., 1850a, 311 (in Falco haliaetos; Halle).—Brand., 1888a, 62; 1890a, 589 (in F. hal.).—Braun, 1893a, 902.—Also reported for Circus cineraceus.

spathaceum (Rud., 1819) Dies., 1850a, 310 (syns. Amphist. lari glauci Rud., Holost. spathaceum Duj., 1845a, 375) (in Larus argentatus, L. argentatoides, L. canus, L. marinus, L. tridactylus; London).—Brand., 1888a, 62 (same hosts); 1890a, 589.—Braun, 1891d, 424 (in Lestris buffonis); 1894k, 681; 1894, 166, 167.—Kowal., 1896d, 252 (2) (in Dominicanus marinus Bruch., Lwow).—Lœnnb., 1891, 76.—Much., 1898, 16, 18–19.—Olss., 1876, 29 (to Diplost.).—Stoss., 1898, 20.—Villot, 1898, 542 (adult of Diplost. volvens).

spathula (Crep., 1825) Dies., 1850a, 309 [also spatula, spatulum] (includes: Strigea falconis palumbarii Viborg, Amphist. falconis palumbarii Rud., A. striatum Rud., A. macrocephalum (Falconis milvi) Rud., A. macrocephalum Bremser non Rud.; Holost. spathula Crep.); 1858e, 319 (in Falco nisus).—Brand., 1888a, 54, 59, 62, 68 (to Dist.); 1890a, 574, 580, 585–586, 589, 596, pl. 40, figs. 15–17 (in Buteo vulgaris, Syrnium aluco).—Braun, 1891d, 424; 1893a, 879, 902; 1893b, 185 (in Circus æruginosus).—Cobbold, 1858b, 164 (in Strix otus, Falco milvus); 1879b, 447.—Kowal., 1896d, (2) 252 (in Buteo vulgaris Bechst.; Dublany).—Linst., 1903, 279 (spatula); 1906, 12 (in Buteo vulg.).—Mol., 1858, 127; 1861, 193–194, pl. 1, figs. 3–5.—Much., 1898, 19.—Par., 620, 1050.—Stoss., 1890, 50; 1892, 66; 1895, 36–37; 1896, 126; 1898, 20.—Wedl., 1857, 257–258, pl. 1, figs. 23–26.—Wolffhuegel, 1900, 9, 11, 12, 14, 15, 16, 17, 44.—Reported also for Accipiter nisus, Aegolius brachyotus, Aquila chrysaëtos, A. nævia, Archibuteo vulgaris, Ascolopax gallinago, Astur nisus, A. palumbarius, Botaurus stellaris, Brachyotus palustris, Bubo maximus, Buteo lagopus, Circaetus gallicus, Circus cyaneus, C. rufus, Falco albicilla, Milvus ater, Otus vulgaris, Picus sp.

species Sons., 1876.—Ward, 1895, 338 (syn. of Gastrodiscus ægyptiacus), in Equus caballus.

triangulare Johnston, 1904, 108–109, pl. 5, figs. 1–6 (in Dacelo gigas Bodd.).

trilobum (Rud., 1819) Dies., 1850a, 310; 1858e, 319 (in Carbo comoranus).—Brand., 1888a, 59; 1890a, 586 (in Pelecanus crispus).—Braun, 1893a, 903.—Stoss., 1897, 9 (in Botaurus stellaris).—Wedl, 1857, 255–257, pl. 2, figs. 20–22.

HEMIURIDÆ Luehe, 1901n, 394–403, 473–488; 1901o, 638–640.—Lander, 1904a, 3.—Looss, 1902m, 839, 848 (includes: Hemiurus, Eurycœlum, Accacœlium, Derogenes, Pronopyge, Liocerca (=Liopyge), Halipegus).

HEMIURINÆ Looss, 1899b, 640; 1901, 438.—Luehe, 1901n, 481.—Nicoll, 1907, 84.—Odhn., 1905, 355–356, 357, 360, 364, 366.—Pratt, 1902, 889, 905 (includes: Hemiurus, Lecithocladium, Pronopyge, Lecithochirium, Lecithaster, Liopyge, Derogenes).

HEMIURUS Rud., 1809a, 38 [type appendiculatus by Stiles & Hass, 1898a, 90] (nec Hemiurus Gervais, 1855, mammal; nec Hemiura Ridgway, 1888, Jan. 6, 511, bird).—Darr, 1902, 698. Linst., 1904, 252.—Looss, 1899b, 527, 534, 551, 571, 582, 583, 638, 639, 640–641, 642; 1901, 194, 201, 207; 1901, 438; 1902m, 756, 781, 805, 830, 831, 839.—Luehe, 1900, 509; 1901, 394, 395, 396–401, 402, 474, 479, 480, 482, 484.—Nicoll, 1907, 84.—Odhn., 1905, 354, 355, 356, 359.—Pratt, 1902, 889, 906.—Stiles, 1901, 177, 178, 185, 193.—Stiles & Hass., 1898a, 90–91, 96 (includes: Dist. (Apoblema), Duj., Apoblema Duj., Eurycœlum *Brock*) (type Fasc. appendiculata Rud.).

HEMIURUS—Continued.

1845: Dist. (Apoblema) Duj., 1845a, 383, 389, 420 [tld. appendiculatum].

appendiculatus (Rud., 1802) Looss, 1899b, 641, 671; 1902m, 831.—Lander, 1904a, 4.—Luehe, 1901, 395, 396, 398, 400, 475.—Nicoll, 1907, 69, 70, 71, 72, 84, 86, 87, 88 (in Anguilla vulgaris, Centronotus gunnellus, Cottus bubalis, Hippoglossus vulgaris, Pleuronectes limanda, Pl. platessa).—Odhn., 1905, 349, 350, 351, 352 (in Alosa finta).—Staff., 1904, May 3, 484 (in esoph., stomach, Canada, of Salmo salar L., Osmerus mordax Mit., Clupea harengus L., Gadus callarias L., Pollachius virens L., Ammodytes tobianus L., Anguilla anguilla L., Acanthocottus scorpius L., Hippoglossus hippoglossus L., Platysomatichthys hippoglossoides Walb.); 1905, Apr. 11, 682, abundant in copepods (Acartia).—Stiles, 1901, 177.

bothryophorus (Olss., 1868) Looss, 1899b, 641, 728–729 (in Alosa finta), 741.

communis Odhn., 1905, 348, 350, 351 (in numerous Scandinavian marine fishes), 352, 353 (syn. Dist. appendiculatum Rud. of Olss., 1868).—Nicoll, 1907, 71, 86–88 (in Ammodytes tobianus, Gadus æglefinus).

crenatus (Rud., 1802) Luehe, 1901n, 395, 397, 398, 399–401 ("nec Looss, 1899") [the synonymy as given by Luehe is not altogether clear].—Lander, 1904a, 1–28, figs. 1–42 (anat.; syns. Fasc. cren. Rud., Dist. cren. Rud., Dist. ocreatum Olss., Apoblema ocreatum Juel, Hemiurus ocreatus Looss); 1904b–c; 1905a.—Nicoll, 1907, 84.—Odhn., 1905, 350, 352, 353, 356 (type of Brachyphallus).—Tennent, 1906, 666.

crenatus (Mol., 1859) Looss, 1899b, 641.—Luehe, 1901n, 399 (not of Rud.).

digitatus Looss, 1899b, 641, 729–731, fig. 48 (in Sphyræna vulgaris; Sawakin, Egypt, Jan.).—Darr, 1902, 659.

exrisus (Rud., 1819) Looss, 1899b, 641.

grandiporus (Rud., 1819) Looss, 1899b, 641, 730.—Luehe, 1901, 401.—Nicoll, 1907, 84.

lævis (Lint., 1898) Looss, 1899b, 641.—Luehe, 1901, 401.—Nicoll, 1907, 84.

levinseni Odhn., 1905, 348–351, pl. 4, fig. 2 (in Gadus saida of East Greenland; also in G. morrhua s. ovak, G. melanostomus, Cottus scorpius, Phycis blennoides; West Greenland, North Denmark) (syns. Dist. appendiculatum Rud. of Olss., and Rud. of Levin.).

lühei Odhn., 1905, 351, 352 (syns. Dist. appendiculatum Rud. of Olss., 1868; H. stossichi Luehe, 1901 [nec Mont., 1891]) (in Clupea harengus, C. sprattus, and ? C. pilchardus).—Nicoll, 1907, 72, 85 86, 87 (syn. of H. stossichii) (in Clupea harengus).

microporus (Mont., 1889) Looss, 1899b, 641.

mollissimus (Levin., 1881) Looss, 1899b, 641.

monticellii (Lint., 1898) Looss, 1899b, 641.

orreatus (Mol. of Olss., 1868) Looss, 1899b, 641 (nec Rud.).—Lander, 1904a, 1, syn. of H. crenatus (Rud.).—Luehe, 1901n, 399.

ruforiridis (Rud., 1819) Looss, 1899b, 641, 730.

sluiteri (Brock, 1886) Looss, 1899b, 641.

species Braun, 1902b, 125.

stossichi (Mont., 1891) Looss, 1899b, 641.—Luehe, 1901n, 398–399, 400 (stossichii).—Nicoll, 1907, 84, 85, 88 (syn. of H. lühei).

stossichi Luehe, 1901n (nec Mont., 1891) of Odhn., 1905, 351, 352 (renamed H. lühei Odhn.) (in Clupea pilchardus).

stossichii Luehe, 1901n, 400, for stossichi.

tornatus (Rud., 1819) Looss, 1899b, 641.

varicus (Mueller, 1784) Looss, 1899b, 641.

(HEMIURUS) Rud., see Hemiurus.

scabrum (Mueller, 1788) Looss, 1899b, 582.

HEPASTOMUM Brand., 1888a, 15, for Heptostomum.

HEPHOSTOMUM Burm., 1856a, 251 ("In anderen Fällen fehlen die Sauggruben am Munde, so bei Dicliophora, Hexacotyle, Hephostomum").

HEPTASTOMUM (for Heptostomum Schomburgk, 1844, 136).—Brand., 1888a, 15 (Hepastomum), 52; 1890a, 578.—Braun, 1893a, 884. Dies., 1850a, 289, 418 (syn. Dist. Henle); 1858c, 314, 369–370 (m. hirudinum).—Fil., 1854a, 23.—Goldb., 1855, 19.—Mont., 1888a, 84, 92.—Tasch., 1879, 234.

HEPTASTOMUM—Continued.

hirudinum Schomburgk, 1844, 136 (in Nephilis vulgaris, Clepsine complanatum) (includes Dist. hirudinis).—Brand., 1888a, 13.—Braun, 1892a, 795.—Crep., 1846, 159.—Dies., 1850a, 418–419 (syn. Dist. hirudinis Henle, D. tarda); 1858c, 370, pl. 2 (in Nephilis vulgaris, Clepsine complanata).—Fil., 1854a, v. 15, 23.

HEPTOSTOMUM Schomburg, 1844, 136, see also Heptastomum.

HERONIMUS MacCallum, 1902, 25 Oct., 632–636 (m. chelydræ) (monostome).

chelydræ MacCallum, 1902, Oct. 25, 632–636, figs. 1–2 (in Chelydra serpentina; Dunnville, Ontario); 1902, Dec. 30, 843–844; 1905, Aug., 62.

HETERACANTHUS Dies., 1836, 307–310 (Axine 1794, renamed, hence type pedatus =bellones renamed) [not Heteracanthus Newberry, 1889, fish]; 1850a, 425 (syn. of Axine).—Braun, 1890a, 518.—Crep., 1838, 83; 1839, 291.—Nord., 1840, 598.—Tasch., 1879, 255 (syn. of Axine Abildg., 1794).

pedatus Dies., 1836c, 310–313, pl. 17, figs. 1–2 (Axine bellones Abildg. on Esox belone renamed); 1850a, 425 (syn. of Axine bellones).—Ben., 1858a, 1861a, 53 (syn. of Ax. bell.).—Crep., 1838, 83 (syn. of Ax. platyura).—Goto, 1894, 196 (Ax. belones partim).—Kroyer, 1846–53a, 273 (in Belone rostrata Fab.).—Nord., 1840, 598 (syn. Ax. bell.) (in Esox belone).—Sieb., 1839, 163.—Stoss., 1898, 14.—Tasch., 1879, 256 (syn. of Ax. belones).

[*politus* (fossil fish).]

sagittatus Dies., 1836, 313, pl. 17, figs. 10–12 (on Esox belone; [Europe]); 1850a, 425 (syn. of Axine bellones).—Ben., 1858a, 1861a, 53 (syn. of Ax. bell.).—Crep., 1838, 83 (syn. of Ax. platyura).—Goto, 1894, 196 (Ax. belones Abildg. partim).—Kroyer, 1846–53a, 273 (in Belone rostrata Fab.).—Nord., 1840, 598–599 (in Esox belone).—Sieb., 1839, 163.—Tasch., 1879, 256 (syn. of Ax. belones Abildg.)

HETEROBOTHRIUM Cerf., 1895m, 141, 142, 145–146 (m. tetrodonis); 1896, 548, 551–552.—Mont., 1903, 336 (subf. Diclidophorinæ).—St.-Remy, 1898, 552.—Zool. Anz., 1895, 327.

tetrodonis (Goto, 1894) Cerf., 1895m, 141, 142, 146 (in Tetrodon sp.; Japan); 1896, 548, 552.—Zool. Anz., 1895, 327.

tetrodontis St.-Remy, 1898, 554 (=Diclidophora tetrodonis), for tetrodonis).

HETEROCOTYLE Scott, 1904, 279 (m. pastinacæ).

pastinacæ Scott, 1904, 279, pl. 17, fig. 14 (in Trygon pastinaca; Dornoch Firth, Oct.).

HETERECOTYLEA Mont., 1905c, 68, apparently for Heterocotylea.—Massa, 1906, 43.

HETEROCOTYLEA Mont., 1892; 1899, 81, 88, 107 (Eterocotylea); 1903, 234; 1903c, 334–336; 1904 (II.10), 65–80, figs. 1–5 (remarks with reference to some species of); 1905c, 65–80, 5 figs.—Braun, 1893a, 889, 917; 1893b, 188; 1895b, 136.—Gamb., 1896a, 73.—Maclaren, 1904, 574, 579, 583, 586, 590, 591, 594, 596, 599.—Much., 1898, 17.—Pratt, 1900, 645, 646 (includes: Temnocephalidæ, Tristomidæ, Monocotylidæ, Polystomidæ, Gyrodactylidæ), 647–654, 655–657, pls. 1–50, 658–661 (key to American species), 661–662; 1902, 890 (key).—Ward, 1903, 864.

HETEROKOTYLEA Schneidemuehl, 1896, 295, for Heterocotylea.

HETEROLOPE Looss, 1899b, 551, 651–652, 653, 655 (not Heterolopa Franzenau, 1884, Protozoon) (orig. species: leptostoma [tod.], opisthotrias, æquans, caudata) (ἕτερος=anders; ἡ λώπη=wall, because of the structure of the skin); 1900, 605.—Braun, 1900h, 6, 11, 13; 1901e, 338 (=Harmost.); 1902b, 114 (syn. of Harmost. Braun, 1899, 492).—Cohn, 1902, 880 (=Harmost.).—Luehe, 1900, 557.—Ofenheim, 1900, 183.

æquans Looss, 1899b, 652, 746–748, fig. 70 (in Gerbillus ægyptius).—Braun, 1900, 12.

caudata (Linst., 1873) Looss, 1899b, 652 (nec Mueller, Bosc, Polonio).

leptostoma (Olss., 1876) Looss, 1899b, 652, 746, 747, 748.

opisthotrias (Lutz, 1895) Looss, 1899b, 652.

HETEROLOPINÆ Looss, 1899b, 653, 655; 1900, 605.—Braun, 1900h, 13.

HETEROPHYES Cobbold, 1866a, 6 (m. ægyptiaca=heterophyes) [this genus was probably published in some earlier paper].—Looss, 1902m, 786, 805, 808, 824; 1902n, 886–891 (revision of); 1903o, 899–900; 1905k, 56; 1907, Mar. 5, 488, 489.—Ward, 1903, 870.

1899: Cotylogonimus Luehe 1899, 538–539 (tod. heterophyes).

1899: Cœnogonimus Looss, 1899b, 585 (tod. heterophyes).

ægyptiaca Cobbold, 1866a, 6 (Dist. heterophyes renamed).

æquatis Looss, 1902n, 888 (in dogs and cats; Egypt).

dispar Looss, 1902n, 888–889 (in dogs and cats).

fraternus (Looss, 1894) Looss, 1902m, 785, 808, 809, 838, 854; 1902n, 887; 1907, Mar. 5, 488 (in Pelecanus onocrotalus; Cairo, Egypt).

heterophyes (Sieb., 1852) Stiles & Hass., 1900a, 563.—Looss, 1902m, 782, 785, 786, 808, 809, 838, 854; 1902n, 889; 1905, 111 (in man, cats, and dogs; Egypt), fig. 18.—Ward, 1903, 704; 1903, 864 (in Homo), 870 (includes: Dist. het. Sieb., 1852; Mesogonimus het. Rail., 1890; Cœnogonimus het. Looss, 1900; Cotylogonimus het. Luehe, 1900), 871.

inops Looss, 1902n, 887–888 (in Pelecanus onocrotalus: Milvus ægyptius s. M. parasiticus; Egypt).

pallidus Looss, 1902n, 889–891 (in Milvus ægyptius s. parasiticus; Egypt).

persicus (Braun, 1901) Looss, 1902m, 782, 785.

HETEROSTOMA Fil., 1837a, 338–340 (m. echinatum) (ἕτερος, diverso; στόμα, bocca); 1857c, 9 (Heterostomum).—Burm., 1856a, 250 (Heterostomum).—Dies., 1850a, 287, 301–303 (syn. Dist. Baer) (Heterostomum); 1855a, 396 (mentions only two species: echinatum, ovatum).—Erc., 1881e, 33; 1882a, 269.—Goldb., 1855, 16.—Moul., 1856a, 12, 16, 121.

1850: Heterostomum Dies., 1850a, 287, 301–303, for Heterostoma.

echinatum Fil., 1837a, 338–339, 340, figs. 16–18 (t. h. Paludina impura; Italy) (an Agamodist.).—Dies., 1850a, 302 (Heterostomum); 1855a, 396; 1858d, 280 (to Cercariæum).—Leidy, 1858a, 110; 1877, 202.—Moul., 1856a, 216 ("pourait bien être un individu libre provenant de la Cerc. paludidæ impuræ Fil.").

helicis asperæ Dies., 1850a, 302–303, based on Duj., 1845a, 472; 1855a, 398 (to Cercariæum helicis aspersæ).

helicis aspersæ Dies., 1855a, 398, for helicis asperæ (to Cercariæum).

helicis pomatiæ (Meckel, 1846) Dies., 1850a, 303; 1855a, 398 (to Cercariæum).

limacis Dies., 1850a, 302 (based on Duj., 1845a, 472–473); 1855a, 397 (to Carcariæum).

limnæi Dies., 1850a, 302 (based on Duj., 1845a, 473); 1855a, 399 (syn. of Cercariæum lymnæi palustris).

ovatum Dies., 1850a, 302 (Dist. luteum Baer, 1827, pl. 29, figs. 20–22, renamed) (in Paludina vivipara: Regiomontii); 1855a, 396 (in Pal. vivip.); 1858d, 279 (to Cercariæum).—Mont., 1893, 190.—Moul., 1856a, 215 (syn. of Dist. luteum Baer).

HEXABOTHRIUM Nord., 1840, 600 (m. appendiculatum).—Cerf., 1899a, 351, 359, 371.—Dies., 1850a, 419, renamed Onchocotyle.—Stoss., 1898, 11.—Tasch., 1879, 252 (syn. of Onchocotyle Dies.).

appendiculatum (Kuhn, 1829) Nord., 1840, 601 (in Squalus catulus).—Dies., 1850a, 419 (type of Onchocotyle) (in Scyllium catulus, Læmargus borealis).—Tasch., 1879, 28 (to Onchocotyle).

HEXACOTYLA Blainv., 1828a, 570–571 (tod. thynni).—Dies., 1850a, 416 (renamed Plagiopeltis).

ocellatum (Rud., 1819) Blainv., 1828a, 571.—Baird, 1853a, 41 (= Polyst.).

thynni (Delaroche, 1811) Blainv., 1828a, 571.—Dies., 1850a, 417 (syn. of Plagiopeltis duplicata, type of Plagiopeltis) (in Thynnus branchypterus, ad insulas Balearicas).

HEXACOTYLE Blainv., 1828a, 570 (same as Hexacotyla; both are used by Blainv.: Hexacotyle has been adopted as the Latin form by a number of authors).—Braun, 1890a, 413, 516, 517, 518, 523, 534, 537, 546; 1893a, 890.—Burm., 1856a, 251.—Cerf., 1895h, 920; 1896, 515; 1899a, 391.—Dies., 1850a, 409, 416 (of Blainv., syn. Hexathyridium Treutler), 421 (of Nord., syn. of Diclibothrium Leuck.).—Gamb., 1896a, 73.—Goto, 1893a, 798, 799; 1894, 215.—Hoyle, 1890, 539.—Mont., 1888a, 89, 100; 1892, Oct. 7, 213 (subg. of Octocotyle); 1903, 336 (= Plagiopeltis) (subf. Plagiopeltinæ).—Nord., 1840, 600.—Pratt, 1900a, 653, 657, fig. 38, on gills of marine fishes.—St.-Remy, 1898, 556.—Tasch., 1879, 69; 1879, 239, 249–250 (syns. Polyst. Roche, Plagiopeltis Dies.), 254 (of Nord., 1840, *syn. of Diplobothrium Leuck.*).

HEXACOTYLE—Continued.

1850: Plagiopeltis Dies., 1850a, 416–417 (duplicata = thynni).

acuta Goto, 1894a, 217–220 (in Thynnus sibi; Hagi and Osatsubé, (Hokkaidō)).—St.-Remy, 1898, 557.

elegans Nord., 1840, 597, 600 (Diklibothrium crassicaudatum renamed) (in Acipenser stellatus).—Dies., 1850a, 421 (syn. of Diclibothrium armatum Leuck.).—Tasch., 1879, 254 (syn. of Diplobothrium armatum Leuck).

grossa Goto, 1894a, 220–222 (in Thynnus sp.; Misaki).—St.-Remy, 1898, 557–558.

lapridis Sars., ——.—Nord., 1840, 600 (in Lampris gullatus).

ocellatum (Rud., 1819) Blainv., 1828a, 571.—Dies., 1850a, 413 (to Polyst.).—Nord., 1840, 600 (in Testudo orbiculata).—Tasch., 1879, 252 (to Polyst.).

pinguicola (Treutler, 1793) Chiaje, 1833, 13 (= Polyst.).

thunninæ (Par. & Perugia, 1889) Goto, 1896, 352; 1899, 273–274, pl. 20, figs. 13–15.—Pratt, 1900, 657, fig. 38.—St.-Remy, 1898, 557.

thynni (Delaroche, 1811) Nord., 1840, 597, 600.—Braun, 1890a, 418, 537, 548.—Dies., 1850a, 417 (duplicata, type of Plagiopeltis).—Goto, 1899, 274.—Lint., 1901, 414 (in Sarda sarda), 446, figs. 296, 297, 298.—Par., 1894, 578; 1899, 3–4; 1902, 3 (in Pelamys sarda, Portoferrajo; Thynnus thynnus, Elba).—Par. & Perugia, 1890, 7.—St.-Remy, 1898, 556–557.—Tasch., 1879, 250 (syns.: Polyst. th. Roche, P. duplicatum Rud., Hex. th. Blainv., Plagiopeltis dup. Dies.) (in Thynnus branchypterus, Pelamys sarda; Napoli).

venarum (Treutler, 1793) Blainv., see Dies., 1850a, 410 (to Hexathyridium).

HEXACOTYLIDÆ Mont., 1899, ——; 1903, 336 (subf.: Diplobothrinæ (g. Diplobothrium); Plectanocotylinæ (g. Plectanocotyle, Phyllocotyle)); 1905, 77, 78.

HEXASTOMA Rud., 1809a, 38, 451–457 (subg. of Polyst. containing: integerrimum [type by inclusion], pinguicola, (genus in Cuv., 1836a, 264).—Dies., 1850a, 409 (syn. of Hexathyridium Treutler).—Kuhn, 1829, 358 (for Polyst. Rud.).—Thon, 1830, v. 7, 341.—Wallenstedt, 1847, 7.

integerrimum (Frœlich, 1791) Rud., 1809a, 451.

pinguicola (Treutler, 1793) [Cuv., 1836a, 264].—Dies., 1850a, 410 (to Hexathyridium).—Dolley.

venarum (Treutler, 1793) [Cuv., 1836a, 264 (to Hexathyridium)].—Dies., 1850a, 410 (to Hexathyridium).

HEXOSTOMA Rafinesque, 1815, 151, n. n. for Polyst. Roche, hence type thynni.

HEXATHIRIDIUM Blainv., 1821a, 144–145 (see Hexathyridium); 1824a, 516; 1828a, 571–572.

venarum (Treutler, 1793) Blainv., 1828a, 572. Joy, 1835a, 505.—See Hexathyridium.

HEXATHYRIDIA Rafinesque, 1815, 151 (genus of Fasciolaria with Polyst. Zed. as syn.) for Hexathyridium.

HEXATHYRIDIUM Treutler, 1793, iv, 19–22 (type by first-species rule, pinguicola; this seems to be taken as type by authors; see, for instance, Braun, 1889a, 317). - Blainv., 1821a, 144–145 (Hexathiridium); 1824a, 516 ("Je doute beaucoup que ce genre puisse être regardé comme véritablement intestinal; il est extrêmement rapproché du polystome de Delaroche; aussi pensais-je qu'il a été décrit à l'envers, ce que l'on voit dans ma définition des caractères de l'ordre"); 1828, 571–572.- Braun, 1890a, 518; 1893a, 887, 891, 892, 894.—Burm., 1856a, 251 (Hexatiridium). -Cerf., 1899a, 351, 371. Dav., 1877a, lxxx.—Dies., 1850a, 288, 409–410, 412 (Blainv., syn. of Polyst. Zed.); 1858e, 314, 368. - Encycl. méthodique, Par., v. 2, 455. Goldb., 1855, 17.—Hoyle, 1890, 539 (probably a syn. for Polyst.). Jœrdens, 1802, 66.—Lamouroux, 1825, 193.—Leuck., 1863, 526; 1867, v. 2 (1), 150; 1868, v. 2 (2), 264.—Looss, 1902m, 756.—Mont., 1888a, 84 (Hexathyridum), 90.- Nord., 1840, 601 (Hexathiridium).—Rud., 1801a, 58; 1809a, 22. Stoss., 1898, 11. Tasch., 1879, 324, 251 (syn. of Polyst. Zed.).- Thon., 1830, v. 7, 341–342 (Hexathiridium).

1809: Hexastoma Rud., 1809a, 38, 451–457 (type by inclusion pinguicola).

1815: Hexathyridia Rafinesque, 1815, 151.

1821: Hexathiridium Blainv., 1821a, 144–145.

1888: Hexathyridum Mont., 1888a, 84.

1856: Hexatiridium Burm., 1856a, 261.

affine Dies., 1850a, 410 (t. h. Bombinator igneus; Berlin).—R. Bl., 1895, 104.- *Schmitz, 1826*, 15, figs. 1–13.

HEXATHYRIDIUM—Continued.

appendiculatum (Kuhn) Nord.—Tasch., 1879, 253 to Onchocotyle (Kuhn) [Nord. uses Hexabothrium app., not Hexathyridium app.].

integerrimum (Frœlich, 1791) Blainv., 1828, 572.—Baird, 1853a, 41 (= Polyst. Rud.).—Dies., 1850a, 412 (to Polyst.).—Stoss., 1898, 10.

pinguicola Treutler, 1793, iv, 19–22, pl. 3, figs., 7–11 (t. h. Homo).—Blainv., 1828, 572.—Aitken, 1866, 804, 841; 1872, 146, 207; 1874, 58.—R. Bl., 1888a, 597.—de Bonis, 1882, 180.—Braun, 1883a, 69–70; 1895b, 155.—Brera, ——, 100, pl. 1, fig. 28.—Cerf., 1899a, 351.—Cobbold, 1866, 7; 1879b, 36.—Dav., 1877a, lxxxi.—Dies., 1850a, 409–410 (includes: Polyst. ping. Zed., Linguatula ping. Lamarck, Hexast. ping. Cuv.); 1858e, 368 (to Polyst.).—Dunglison, 1893, 529, 821.—Hackley, 1886, 519.—Hoyle, 1890, 538.—Jœrdens, 1802, 66, pl. 6, figs. 3–5.—Kholodk., 1898, 26, pl. 10, fig. 24.—Kuech., 1855, 464.—Leuck., 1863a, 526, 585, fig. 195.—Moniez, 1896, 108.—Mosler & Peiper, 1894, 186.—Mont., 1888, 90.—Rud., 1809a, 455 (t. Polyst.).—Verrill, 1870, 171.—Ward, 1895, 328 (in Homo).—Weinland, 1859, 281.

venarum Treutler, 1793, iv, 23–25, pl. 4, figs. 1–3.—Aitken, 1866, 804, 841–842; 1872, 146, 206; 1874, 58.—Biermer, 1863a, 393.—Blainv., 1828a, 572 (Hexathiridium).—R. Bl., 1888a, 596, 597; 1891, 605.—de Bonis, 1882, 181.—Braun, 1883a, 69; 1895b, 139; 1903, 3 ed., 150 (from Vena tibialis antica, probably young F. hepatica. Duval found adult F. h. in Vena portarum and other veins at Rennes (1842), and Vital (1874) describes same kind of case from Constantine); 1906, 155 (in Homo sapiens).—Bremser, 1824, 327–329, pl. 9, fig. u.—Cerf., 1899a, 351.—Cobbold, 1866, 7; 1879b, 36.—Crep., 1839, 290.—Dav., 1877, lxxxi, 329–330, figs. 15, 42.—Dies., 1850a, 410 (includes Polyst. ven. Zed., Polyst. sanguicola delle Chiaje, Linguatula ven. Lamarck, Hexast. ven. Cuvier, Hexacotyle ven. Blainv.); 1858e, 368.—Duval, 1842a, 771, 772.—Duj., 1845a, 321.—Dunglison, 1893, 529, 821.—Hackley, 1886, 519.—Hahn & Lefèvre, 1884a, 540–541.—Hémont, 1827, 16.—L'Herminier, 1826, 13.—Hoyle, 1890, 538.—Joy, 1835a, 505.—Kholodk., 1898, 26, pl. 10, fig. 23.—Kuech., 1855, 464.—Leuck., 1863a, 526, 575, 585, fig. 194.—Moniez, 1896, 108.—Mont., 1888, 90.—Mosler & Peiper, 1894, 186.—Rud., 1809a, 456 (to Polyst., as sp. inq.).—Sieb., 1839, 164.—Stiles, 1898a, 48.—Verrill, 1870, 171.—Ward, 1895, 328 (in Homo); 1903, 866.—Weinland, 1859, 281.

HEXATHYRIDUM Mont., 1888, 84, for Hexathyridium.

HEXATIRIDIUM Burm., 1856a, 251 (see Hexathyridium).

HIRUDELLA Poir., 1885, 5, 7 [not Muenster, 1842, leech], see Hirudinella.

HIRUDINELLA [Garsin, 1730, 58–59, fig., prelinnæan (m. marina); 1735, 261, pl. 4, figs. 1–3].—Blainv., 1824a, 518 ("hirudinelle"; "J'admets ce genre pour les fascioles cylindriques qui ont quelque ressemblance avec les sangsues, et entre autres le fasc. clavata Linn."); 1828, 586 (type clavata) [not Hirudinella Gray, 1850, mollusk; not Hirudinella Muenster of Dies., 1850a, leech].—Baird, 1853a, 59.—Buttel-Reepen, 1902, 168.—Darr, 1902, 644, 648, 658, 662–699.—Dies., 1850a, 292.—Encycl. méthodique, Par., v. 2, 456.—Lamouroux, 1825, 241.—Planque, ——, 993, 221.—Poir., 1885, 5, 7 (Hirudella) [not Hirudella Muenster, 1842, renamed Hirudinella by Dies., 1850].—Stiles, 1901, 194 (type Fasc. clavata).

1885: Hirudella Poir., 1885, 5, 7 [not Muenster, 1842], for Hirudinella.

[*angusta* Muenster, 1842, 98, pl. 1, fig. 5.—Dies., 1850a, 471; 1859, 511.—Pictet, ——, 457.—A leach.]

clavata (Menzies, 1791) Blainv., 1828, 586.—Baird, 1853a, 59 (includes H. marina Garsin, Fasc. clav. Menzies, F. scombri pelamidis Tilesius, F. coryphænæ Bosc, Dist. clav. Rud.).—Buttel-Reepen, 1902, 167, 168, 171, 185, 190, 191, 193, 195, 198, 202, 206, 209, 212, 214, 218 (syn. of Dist. ventricosum).—Darr, 1902, 649, 652, 657, 658, 667, 668, 669, 670, 676, 678, 680, 682, 687, 689, 690, 692, 696, 698–699, 1 fig., pl. 34, figs. 16–25, pl. 35, figs. 26–34.

ingens (Moniez, 1886) Darr, 1902, 687, 688.

marina Garcin, 1730a, 387–394, pl. 1, fig. 2 (in Scomber pelamys); 1732a, 43–44, 1 pl., 3 figs.—Baird, 1853a, 59 (=clavata).—Buttel-Reepen, 1900a, 586; 1902, 166, 168, 194, pl. 6, fig. 1.—Cobbold, 1879b, 461.—Darr, 1902, 663, 664.

[*tenuis* Muenster, 1842, 99.—Dies., 1850a, 471 (a leach); 1859, 511.—Pictet, ——, 457.]

ventricosa (Pallas, 1774) Baird, 1853a, 59–60 (includes Fasc. ventr. Pallas, F. fusca Bosc, F. coryphænæ hippuridis Tilesius, Dist. coryphænæ Rud., D. clavatum Owen).

HIRUDO Linn., 1758a, 644, 649 (type by Linnæan rule, medicinalis).—Several species of this genus have been placed in the trematodes; the genus is now confined to the leeches.—Dies., 1850a, 318 (of Braun, syn. of ?Diplodiscus), 425 (of Abildg., syn. of Nitzschia Baer), 426 (of Mueller, syn. of Phylline Oken), 427 (of Kroyer, syn. of Udonella Johnston), 433 (of Braun, syn. of Astacobdella Vallot), 439 (of Linn., syn. of Ichthiobdella Blainv.), 445 (of Mueller, syn. of Malacobdella Blainv.), 446 (of Mueller, syn. of Clepsine Savigny), 456 (auct., syn. of Nephelis Savigny), 461 (auct., syn. Aulost. Moquin-Tandon), 462 (auct., syn. of Hæmopis Savigny et Moquin-Tandon), 465–471 (of Rai et Linn., syns. of Sanguisuga Savigny; Iatrobdella Blainv.), 567 (of La Martinière, syn. of Tetrarhynchus Rud.), 583 (of Linné, syn. of Schistocephalus Crep.).

fasciolaris Mueller, 1788b, pl. 54, figs. 1–3 (is included in Fasc. anatis Gmelin, 1790a, 3055.)—Dies., 1850a, 335 (syn. of Dist. ovatum Rud.).

grossa Mueller, 1788, 21–22, pl. 21.—Bruguière, 1791a, pl. 52, figs. 6–8.—Dies., 1850a, 445 (to Malacobdella).—Gmelin, 1790a, 3098.

hippoglossi Mueller, 1776a, 220 (t. h. Hippoglossus; Denmark); 1788a, 18, pl. 54, figs. 1–4.—Baer, 1827b, 676, pl. 32, figs. 5–6.—Dies., 1850a, 426 (to Phylline).—Fabricius, 1780a, 322, pl. 1, fig. 8.—Gmelin, 1790a, 3098.—Leuck., 1842a, 11.—Oken, 1815 (to Phylline).

sturionis Abildg., 1794b, 55–56, pl. 6, fig. 1, a–c (in Stören).—Cuvier, ——. —— (to Trist.).—Dies., 1850a, 426 (syn. of Nitzschia elegans Baer).—Gmelin.

tuba Braun, 1805, 49, pl. 5, figs. 5–8 (see Rud., 1809a, 348 =Amphist. subclavatum).—Dies., 1850a, 318 (syn. of Diplodiscus subclavatus Dies.).

HISTRIOBDELLA Ben., 1858i, 2 pls.

HISTRIONELLA Bory de St. Vincent, 1823b, 356; 1825b, 252–253.—Braun, 1893a, 884.—Burm., 1856a, 250.—Dadai, 1888f, 84, 85; 1888g, 107.—Dies., 1850a, 286, 294 (of Bory syn. of Malleolus Ehrenberg), 299–300 (of Bory & Ehrenberg, includes Cerc. Nitzsch, Brachionus Schrank); 1855a, 378 (eyes), 392, 393 (syn. Brachionus Schrank); 1858d, 267.—Goldb., 1855, 16.—Moul., 1856a, 121, 124.—Nord., 1840, 617, 631.—Pag., 1857, 5, 24.–Wagener, 1857, 24.

—— Hemprich & Ehrenberg, 1828a, Entozoa, not paged, n. g. of Cercozoorum, type evidently ephemera; includes also alata.

alata Hemprich & Ehrenberg, 1828a (in water at Berlin, Germany).—Dies., 1850a, 300 (sp. inq.); 1855a, 392–393 (Hab. primitivum ignotum); 1858d, 268 (free; Berlin).

annulicauda Bory, 1825b, 253.—Dies., 1850a, 299 (syn. of Histrionella lemna Ehrenb.).

bilineata (Haldemann, 1840) Dies., 1850a, 300 (in Limnæus catascopium; Penn.); 1855a, 393 (in Lymnæus cat.); 1858d, 269 (in Lymn. cat.; Penn.).

echinocerca (Fil., 1857) Mont., 1888, 193, 194.—Dadai, 1888f, 85; 1888g, 108.–Dies., 1858d, 267–268 (larva of Dist. appendiculatum Rud.) (in Buccinum linnæi; Genoa).

elegans (Mueller, 1855) Dies., 1858d, 269 (syn. Cerc. elegans Mueller in Valette, 1855) (free).—Dadai, 1888f, 85, 86; 1888g, 108, 109.—Mont., 1888, 193, 194.

ephemera (?Nitzsch, 1807) Hemprich & Ehrenberg, 1828a, pl. 6, fig. 3.—Dies., 1850a, 299 (includes Cerc. V. Baer, 1827, 625, pl. 31) (in Paludina vivipara: Regiomontii; Planorbis corneus; April, Halle, Berlin); 1855a, 392 (in Pl. corn., Pal. vivip.); 1858d, 244 (of Sieb. syn. of Glenocerc. flava Dies.), 267 (syn. of Cerc. ephemera Wagener) (of Ehrenberg larva of Dist. trigonocephalum Rud.) (in Pl. corn., Pal. vivip.).—Moul., 1856a, 204 (to Cerc.).—Sieb., 1843.

fissa Bory de St. Vincent, 1824, 456; 1825b, 252 [see Lamouroux, 1824a].—Dies., 1850a, 295 (syn. of Malleolus furcatus).—Moul., 1856a, 168 (is not syn. of Cerc. furcata).

inquieta (Mueller, 1786) [Bory de St. Vincent, 1825b, 253 (Histrionelle inquiete)].—Dies., 1850a, 300 (sp. inq.) (in aqua marina); 1855a, 393 (Hab. primitivum ignotum); 1858d, 268–269 (free, Hafniæ).—Pag., 1862, 298.

lemna (Mueller, 1773) Hemprich & Ehrenberg, 1828.—Dies., 1850a, 299–300 (includes: Brachionus proteus Schrank, Cerc. major Nitzsch, Histr. annulicauda Bory) (in Lymnæus stagnalis, Planorbis carinatus, P. corneus); 1855a, 392 (in Lymn. stag. et Pl. corn.); 1858d, 268 (in Pl. carinatus, P. corn., *Lymn. stag.*).

HISTRIONELLA—Continued.

melanoglena Dies., 1855a, 393 (Melanoglena bipunctata Eichwald renamed) (Hab. primitivum ignotum); 1858d, 245 (to Glenocerc.).

[*pupula* Bory de St. Vincent, 1825b, 252 (Histrionelle poupée, Enchelis pupula Mull.).]

setosicauda Dadai, 1888f, 84–86, pl. 3, figs. 11, 13; 1888g, 107–109, pl. 3, figs. 11, 13.—Mont., 1888, 77 (setosicaudata); 1888, 193, 194 (setosicaudata).

setosicaudata Mont., 1888, 77; 1888, 195, 194 (for setosicauda).

HISTRIONELLINA Dies., 1858d, 269 (type?).

erythrops (Dies., 1855) Dies., 1858d, 270 (in Paludina impura; Regiomonti).

fissicauda Dies., 1858d, 269–270 (syn. Cerc. ocellata Valette) (in Lymnæus stagnalis; Berlin).—Linst., 1878.

melanops (Dies., 1855) Dies., 1858d, 270 (syns. Cerc. melanops Dies.) (in Paludina impura; Regiomonti).

HOLLOSTOMOM Erc., 1881c, 88, for Holostomum.

HOLOMETRA Looss, 1899b, 564 (tod. exigua); ὁλος, entire; ἡ μήτηρ, uterus.—Braun, 1902b, 5.—Pratt, 1902, 888, 896.—Rail., 1900, 242.

exigua (Mueh., 1898) Looss, 1899b, 564, 678–679, fig. 4 (in Circus rufus; Adelen Island, Nile, near Heluan).—Stoss., 1904, 11.

HOLORCHIS Stoss., 1901, 93 (5) (tod. m. pycnoporus).

pycnoporus Stoss., 1901, 92–93 (rep. 4–5), pl. 6, fig. 10 (in Sargus salviani; Triest).

HOLOSTOMATIDÆ Gamb., 1896, 63, 67, 73.

HOLOSTOMEÆ Brand., 1888a, 1–68, 72 pp. (family); 1889d, 241–245; 1890a, 590.

HOLOSTOMIDÆ E. Bl., 1847, 317.—R. Bl., 1888a, 541 (embraced in Distomiens).—Brand., 1888a, 63; 1890a, 549–604, pls. 39–41; 1891a, 415–416.—Braun, 1883a, 58; 1890a, 515; 1892a, 570, 696, 707, 774, 775; 1893a, 887, 890, 895, 899, 900; 1894l, 165–167; 1894m, 755; 1894k, 680–682 (development); 1895b, 136.—Heider, 1900, 21.—Hoyle, 1890, 539 (Holost., Hemist., Eustemma).—Jackson, 1888, 654 (Holost.; larval forms Tetracotyle, Diplost., Hemist.).—Johnston, 1904a, 108–116 (from Australian birds), pls. 5–6; 1904b; 1904c, (VII, 12), 759–760; 1905 (I, 31), 13.—Looss, 1899b, 541, 543.—Mont., 1888a, 91; 1891, 109, 110; 1892, Oct. 7, 214 (f. of Malacocotylea).—Much., 1898, 18.—Pratt, 1902, 889–890, 908 (includes Cyathocotylinæ, Diplostominæ, Hemistominæ, Holostominæ).—Rettger, 1897, 224–225.—Schneidemuehl, 1896, 295.—Stiles & Hass., 1898a, 87.—Stoss., 1898, 20.

HOLOSTOMINÆ Mont., 1892, Oct. 7, 214 (subf. of Holostomidæ).—Braun, 1893a, 890, 895, 903.—Much., 1898, 19.—Pratt, 1902, 890 (Holostomum).

HOLOSTOMA, see Holostomum.

HOLOSTOMUM Nitzsch, 1819, 399–401 (type by inclusion variabile=Planaria strigis, type of Strigea); 1819, 35.—Baillet, 1866b, 99, 106.—Blainv., 1824a, 518 (holostome); 1828, 583–584.—E. Bl., 1847, 318.—Brand., 1888a, 8, 9, 10, 12, 13, 14, 17, 49, 50, 63; 1888b, 424–426; 1888, 954; 1889a, 67–68; 1890a, 576, 579, 590 (of Rud.).—Braun, 1883a, 40; 1892a, 570, 581, 600, 681, 715, 748, 792, 793, 794, 795, 797; 1893a, 844, 872, 879, 884, 886, 887, 890, 894, 895, 900, 902, 903, 905, 917; 1894, 166; 1895b, 132, 136.—Burm., 1837, 530; 1856a, 250.—Carus, 1863, 479.—Crep., 1839, 286, 287.—Dav., 1877, lxxix.—Dies., 1836, 237; 1850a, 287, 305 (of Nord., syn. of Diplost.), 307 (of Nitzsch pars, syn. of Hemist.), 312–317 (of Nitzsch syns.: Plan. Gœze, Festuc. Schrank, Fasc. Gmelin, Strigea Abildg., Amphist. Rud.); 1858c, 312, 319–322.—Duj., 1845a, 364–366.—Dunglison, 1893, 533.—Eichwald, 1829a, 248.—Fischer, 1840, 156.—Fischder., 1902a, 6, 7 =Strigea); 1903h, 487 (=Amphist. capite discreto), 490 (syn. of Strigea), 507.—Gamb.,1896, 73.—Goldb., 1855, 17.—Hoyle, 1890, 539.—Jackson, 1888, 643, 648, 652, 653, 654 (Tetracotyle, Diplost.: larval forms).—Johnston, 1904, 3 n. Australian sp. from birds.—Lamouroux, 1822a, 194, 297 (syn. of Amphist.).—Leuck., 1863, 452, 524.—Looss, 1902m, 438, 439.—Luehe, 1901, 175.—Macleay, 1886, 342.—Mont., 1888, 8, 34, 63, 68, 71, 72, 83, 84, 91, 95, 104; 1891, 101, 105, 109; 1892, Oct. 7, 214 (gen. of Holostominæ); 1892, 709.—Moul., 1856a, 12, 15.—Nord., 1840, 626, 627–628.—Par., 1887, 329.—Pratt, 1902, 890, 908.—Schneidemuehl, 1896, 295.—Stoss., 1898, 51.—Tasch., 1879, 233.—Villot, 1898, 538; 1878, 19.—Wallenstedt, 1847, 7.—Wolf, 1903, 607.—See Strigea.

HOLOSTOMUM—Continued.

alatum (Gœze, 1782) Nitzsch, 1819, 399, 400, pl. 4, figs. 1–4 (syns. **Plan. al. Rud.**, Plan. al. Gœze, Dist. vulpina Abildg.).—Baillet, 1866b, 106–107 (syn. Hemist. al.).—Ben., 1858a, 1861a, 179.—Blainv., 1828, 583.—E. Bl., 1847, 318–320, pl. 10, fig. 1.—Brand., 1888a, 10, 12, 38, 39, 60 (to Hemist.).—Cobbold, 1879b, 300.—Crep., 1829b, 66; 1839, 287.—Dav., 1877a, lxxix.—Dies., 1850a, 308 (to Hemist.).—Duj., 1845a, 367, pl. 8, fig. D.—Dunglison, 1893, 533.—Gurlt, 1831a, 375, pl. 8, figs. 39–40.—Macleay, 1886, v. 10, 342.—Mehlis, 1831, 175.—Mont., 1891, 105.—Nord., 1840, 628 (syn. Dist. al. Rud.).—Stoss., 1890, 131.—Verrill, 1870, 173.—Ward, 1895, 341 (in Canis familiaris).

anatis nigræ Dies., 1858c, 322, sp. inq. (based on Bellingham, 1844a, 340) (in Anas (Oidemia) nigra).—Brand., 1888a, 68 (syn. of H. crenulatum Cobbold); 1890a, 596.—Braun, 1893a, 903.—See also crenulatum.

auritum Duj., 1845a, 370 (t. h. Strix flammea; Rennes).—Brand., 1888a, 12.—Dies., 1850a, 312 (to Hemist.).

bellinghamii Cobbold, 1860a, 45, falconum renamed (in Falco nisus, F. rufus).—Brand., 1888a, 68 (in F. nisus, F. rufus); 1890a, 596 (syn. H. falconum Dies.).

brevicaudatum Nord., 1832a, 52–53 (t. h. Barbus communis; Berlin); 1840, 618.—Braun, 1892a, 795.—Crep., 1839, 287.—Dies., 1850a, 306 (to Diplost.).—Duj., 1845a, 380.—Gescheidt, 1833a, 430.—Moul., 1856a, 220.—Steenstrup, 1842, 58.

bulbosum Brand., 1888a, 67; 1890a, 595 (in Geronticus albicollis, Nauclerus furcatus).—Braun, 1893a, 903.

bursarium Nitzsch, in Giebel, 1857, 265 (t. h. Falco peregrinus).

bursigerum Brand., 1888a, 65 (in Larus ridibundus; Wien. Mus.); 1890a, 592, pl. 41, figs. 15–18.—Braun, 1892a, 586; 1893a, 903.—Stoss., 1891, 216; 1892, 65; 1898, 22.

cinctum Brand., 1888a, 34, 67 (in Ardea sp.; by Natterer); 1890a, 564, 594, pl. 41, figs. 21–22.—Braun, 1893a, 903 (Brazil).

clavus Mol., 1858, 128 (t. h. Gadus merlucius; Patavii); 1861, 196–197, pl. 1, figs. 9–11.—Brand., 1888a, 67; 1890a, 595.—Braun, 1893a, 874, 903.—Cobbold, 1879b, 462.—Dies., 1858c, 322 (in G. merl.).

coniferum Mehlis in Crep., 1846, 138 (t. h. Colymbus cristatus).

cornu Nitzsch in Rud., 1819a, 89, 357 (t. h. Ardea cinerea) (to Amphist.).—Brand., 1888a, 66; 1890, 594 (in Ardea sp.).—Braun, 1893a, 879–903; 1894k, 682.—Dies., 1850a, 315 (syn. Amphist. cornu Rud nec Dies.); 1858c, 321 (Amphist. cornu Bellingham) (in Ardea cinerea, A. herodias, A. stellaris).—Duj., 1845a, 374.—Linst., 1877, 187.—Schlotthauber, 1860, 129.—Stoss., 1895, 37; 1897, 9; 1898, 22 (in Ardea cinerea, Rovigno; A. purpurea; Monfalcone).—Wedl, 1857, 253–254, pl. 1, fig. 19.—Westrumb, 1823, 394.—Wolffhuegel, 1900, 9, 12.—Reported also for Accipiter nisus, Ardea garzetta, A. purpurea, Ciconia alba.

cornucopia Mol., 1859, 287–288 (t. h. Strix flammea; Batavii); 1861, 196, pl. 1, fig. 8.—Brand., 1888a, 68 (in Strix otus); 1890a, 596 (in Otis vulgaris).—Braun, 1892a, 585, 610, 674, 784, 785, 786, 787, 792, 793, 794; 1893a, 903.—Dies., 1859c, 424 (cornucopiæ).—Jackson, 1888, 652.—Linst., 1877, 188–191, pl. 13, fig. 20, pl. 14, figs. 29–30; 1885, 253–254, pl. 15, fig. 31; 1890f, 186 (cornucopiæ); 1906, 14 (in Strix flammea).—Piana, 1898, 9.—Also reported for Ægolius otus.

cornucopiæ Dies., 1859c, 424, for cornucopia.

cornutum (Rud., 1809) Duj., 1845a, 372–373.—Brand., 1888a, 68 (syn. H. multilobum Cobbold) (in Charadrius pluvialis); 1890a, 596 (of Dies.).—Braun, 1893a, 903.—Dies., 1850a, 316–317.

coronc Dies., 1858c, 322 (in Corvus corone; Ireland).—Brand., 1888a, 68 (syn. of H. dubium Cobbold); 1890a, 596.—Braun, 1893a, 903.

crenulatum Cobbold, 1860a, 47 (in Anas nigra; Ireland).—Brand., 1888a, 68 (syn. H. anatis nigræ Dies.) (in Anas oidemia); 1890a, 596 (in Œdemia nigra).

cuticola Nord., 1832, 43, 49–52, pl. 4, figs. 1–4 (in Cyprinus carpio, C. brama, C. blicca, C. idus, C. rutilus, C. erythrophthalmus), belongs to Cryptostomum; 1840, 618, 628.—Brand., 1888a, 11, 15.—Braun, 1892a, 795.—Crep., 1839, 287; 1846, 154.—Dies., 1850a, 306 (to Diplost.).—Duj., 1845a, 379–380.—Gescheidt, 1833a, 429.—Kroyer, 1838–40a, 21, 578; 1846–53a, 388, 399, 434, 446, 462; 1852–53a, index (cuticula, 1250) (in Perca fluviatilis L., Abramis brama L., A. blicca Bl., Leuciscus erythrophthalmus L., L. rutilus L., L. idus L.).—Moul., 1856a, 217–218, 220 (in Perch, cyprins).—Pavesi, 1881, 615, 616 (*in* Cobitis tænia).—Steenstrup, 1842, 58.—Villot, 1898, 541.—Waldenburg, *1860, 5, 11*.—Also reported for Cyprinus vimba.

HOLOSTOMUM—Continued.

cuticula Kroyer, 1852–53a, 1250, for cuticola.

denticulatum (Rud., 1819) Duj., 1845a, 372, pl. 8, fig. a, 1, 2.—Brand., 1888a, 12.—Dies., 1850a, 311 (to Hemist.) (in Alcedo ispida; Rhedoni).—Villot, 1878, 19; 1898, 538.

dubium Cobbold, 1860a, 45 (in Corvus corone).—Brand., 1888a, 68 (syn. H. corones Dies.); 1890a, 596 (in C. corone).

ellipticum Brand., 1888a, 67 (in Bubo magellanicus; by Natterer); 1890a, 595.—Braun, 1893a, 903.—Linst., 1906, 15.

erraticum (Rud., 1809) Duj., 1845a, 373–374.—Baillet, 1866b, 107.—Brand., 1888a, 59 (of Linst., 1877c) (syn. of Hemist. pileatum), 63–64; 1890a, 571, 586, 591, pl. 41, figs. 3–4.—Braun, 1892a, 797; 1893a, 844, 874, 879, 903 (Brazil); 1894, 166.—Dies., 1850a, 313 (syns. Strigea anatis tadornæ Viborg, S. candida Abildg., Amphist. anatis tadornæ Rud., A. isost. Rud., A. erraticum Rud., H. macrocephalum Crep.); 1858c, 320 (syn. Amphist. isostomum Bellingham) (in Anas boschas fera, A. ferina).—Erc., 1881c, 48–54, 88 (Hollostomom); 1882a, 284–290, 324.—Kowal., 1894, 2.—Linst., 1877, 188, pl. 13, figs. 18–19; 1906, 14 (in Strix otus, Falco albicilla).—Mont., 1888a, 71.—Olss., 1893, 8.—Par., 1899, 4; 1902, 4 (in Querquedula circia; Elba).—Piana, 1898, 4.—Also reported for Alca torda, Anas boschas, A. crecca, A. fusca, Ascolopax gallinago, Colymbus arcticus, C. balticus, C. septentrionalis, Fuligula cristata, F. ferina, F. marila, Harelda glacialis, Limosa melanura.

eustemma Brand., 1888a, 65–66 (in Accipiter pileatus; Brazil); 1890a, 593, pl. 41, fig. 25 (syn. Eustemma caryophyllum Dies.).—Braun, 1893a, 903.

excavatum (Rud., 1803) Nitzsch, 1819, 399, figs. 5–7 (in Ardea nycticorax).—Ben., 1868, 296, 300, pl. 2, figs. 6–8.—Blainv., 1828, 584.—Brand., 1888a, 12.—Braun, 1893a, 903; 1894k, 682.—Dies., 1850a, 309 (to Hemist.).—Duj., 1845a, 375.—Gamb., 1896, 63.—Leuck., 1879, 14; 1886d, 11.—Looss, 1892, 14.—Nord., 1840, 628.

excisum Linst., 1906, 12–15, pl. 1, figs. 14–16 (in Ægolius otus, Strix flammea).

exiguum Mehlis in Crep., 1846, 145 (t. h. Cygnus musicus).—Also reported for Mergus merganser, M. serrator.

falconum Dies., 1858c, 322, sp. inq. (based on Bellingham, 1844, 39) (in Falco nisus et F. rufus; Hibernia).—Brand., 1888a, 68 (syn. of H. bellinghamii Cobbold); 1890a, 596.—Braun, 1893a, 903.—Linst., 1883, 311.—See also bellinghamii.—Also reported for Astur nisus, A. palumbarius, Circus rufus.

gracile (Rud., 1819) Duj., 1845a, 378.—Brand., 1888a, 68 (in Mergus merganser); 1890a, 595, pl. 41, fig. 26.—Braun, 1893a, 903.—Crep., 1846, 141, 142, 144, 145.—Dies., 1850a, 315; 1858c, 321 (in Colymbus glacialis, Anas nigra) (Amphist. gracile Bellingham).—Kowal., 1896d, (2) 252 (in Anas crecca, A. boschas dom.; Dublany); 1904, (8) 23 (in Mergus merganser).—Linst., 1877, 188, pl. 13, fig. 17.—Par., 1901, 6.—Also reported for Anas clangula, A. fusca, Anser albifrons.

hillii Johnston, 1904, 110–111, pl. 6, figs. 1–8 (in Larus novæ hollandiæ Stephens).

isostomum (Rud., 1814) Duj., 1845a, 377.

lagena Mol., 1858, 127 (t. h. Strix passerina; Patavii); 1861, 195.—Brand., 1888a, 68 (in St. pass.); 1890a, 596 (in Glaucidium passerinum).—Braun, 1893a, 903.—Dies., 1858c, 320 (in St. pass.).—Linst., 1906, 15 (in Gl. pass.).

longicolle (Rud., 1819) Duj., 1845a, 374–375.—Brand., 1888a, 64–65 (in Botaurus stellaris; Wien. Mus.); 1890a, 592, pl. 41, fig. 19.—Braun, 1892a, 586; 1893a, 903.—Crep., 1849, 69.—Dies., 1850a, 316; 1858c, 321 (in Larus argentatus) (syn. Amphist. longicolle Bellingham).—Leuck., 1863, 481.—Mol., 1859, 818 (in Larus ridibundus; Padua).—Mueh., 1898, 19.—Par., 1887, 330–331.—Stoss., 1890, 50; 1891, 216; 1895, 37; 1897, 9; 1901, 91 (3) (in Botaurus stellaris; Albona); 1898, 21–22.—Reported also for Ardea alba, A. stellaris, Larus cachinnans, Xema ridibundum.

lyratum Schlotthauber, 1860, 129 (in Ardea cinerea).

macrocephalum (Rud., 1803) Blainv., 1828, 584.—Baird, 1853, 47.—Brand., 1888a, 68; 1890a, 596.—Braun, 1891d, 424 (in Aquila chrysaëtos, Astur palumbarius, Circus æruginosus, C. cyaneus, Strix noctua); 1893b, 185.—Crep., 1839, 288; 1846, 130.—Dies., 1850a, 312, 313 (of Crep. and Duj., syn. of H. variabile Nitzsch), 313 (of Crep. pars, syn. of H. erraticum Duj.); 1858c, 320 (of Crep., 1849, 1, 64, syn. of H. variabile Nitzsch).—Duj., 1845a, 368–369.—Fischer.,

HOLOSTOMUM—Continued.

1901, 367; 1902a, 7 (Plan. strigis Gœze, 1782); 1903h, 490 (=strigis, type of Strigea, Amphist., Holost.).—Leuck., 1863, 460.—Linst., 1906, 14 (syn. H. variabile Nitzsch) (in Buteo vulgaris).—Shipley, 1905, v. 6 (1),7 (type of Strigea).—Stoss., 1890, 131; 1890, 50; 1891, 111; 1892, 66; 1896, 126; 1898, 21.—Also reported for Falco buteo, F. nisus, F. palumbarius.

megalocephalum Brand., 1888a, 67 (in Stomias sp.; by Natterer); 1890a, 595.—Braun, 1893a, 903 (Brazil).

microstomum (Rud., 1809) Duj., 1845a, 371.—Brand., 1888a, 68 (in Corvus caryocatactes); 1890a, 596 (in Caryocatactes nucifraga).—Braun, 1893a, 874, 903.—Dies., 1850a, 314 (in Corv. caryoc.; Gryphiæ).

multilobum Cobbold, 1860a, 46–47 (in Charadrius pluvialis).—Brand., 1888a, 68; 1890a, 596 (syn. of H. cornutum Dies.).

musculicola Waldenburg, 1860, 12 (in Cyprinus, Perca fluviatilis).—Brand., 1888a, 15, 52; 1890a, 578.—Villot, 1898, 542.—Reported for Abramis brama, Scardinius erythrophthalmus.

musculosum Johnston, 1904, 112–114, pl. 7, figs. 4–9 (in Sterna bergii Licht.).

nitidum Leidy, 1856, 45 (t. h. Rana pipiens).—Brand., 1888a, 14, 68 (in R. pip.); 1890a, 595.—Braun, 1893a, 903.—Dies., 1858e, 321–322 (in R. pip.; Phila.).—Staff., 1902, 724.

ochreatum Nitzsch, in Giebel, 1857, 265 (t. h. Falco haliaëtos).

patagiatum Crep., 1846, 135 (t. h. Ardea stellaris).

pellucidum Schlotthauber, 1860, 129 (in Petromyzon fluviatilis).

pileatum (Rud., 1802) Blainv., 1828, 584.—Duj., 1845a, 377.—Ben., 1858a, 1861a, 179.—Brand., 1888a, 12.—Braun., 1893a, 903.—Crep., 1846, 137.—Dies., 1850a, 314–315.—Reported for Sterna macrura.

platycephalum (Crep., 1825) Duj., 1845a, 376.—Baird, 1853a, 48.—Brand., 1888a, 63 (syn. of H. variegatum Duj.); 1890a, 591.—Braun, 1891d, 424 (in Larus ridibundus); 1893a, 876; 1893d, 467; 1894, 166.—Crep., 1839, 287; 1846, 129, 136, 139.—Dies., 1850a, 313.—Mégnin, 1891a, 323 (in Larus ridibundus).—Much., 1898, 16.—Reported also for Carbo cormoranus, Colymbus cristatus, C. rufogularis, Falco albicilla, Halieus carbo, Larus argentatus, L. canus, L. fuscus, Lestris pomarina.

podomorphum Nitzsch, 1819, 399–400, figs. 8–10 (in Falco haliaëtos; Europe).—Brand., 1888a, 12; 18—, 62.—Dies., 1850a, 311 (to Hemist.) (in F. hal.; Halle).—Duj., 1845a, 370.

rotundatum Linst., 1877, 187–188 (in Lanius collurio).—Brand., 1888a, 66 (syn. of H. sphærula Duj.) (in Lanius collurio); 1890a, 593.

serpens Nitzsch, 1819, 400–401 (in Falco haliaëtos), figs. 17–22; in Rud., 1819a, 88, 353–354 (t. h. Falco haliaëtus) (to Amphist. by Rud., 1819a, 88, 353; returned to Holost. by Duj., 1845a, 371, and Dies., 1850a, 316); 1819, 399, 400–401, pl. 4, figs. 17, 22.—Ben., 1858a, 1861a, 197.—Blainv., 1828a, 584.—Brand., 1888a, 11, 68 (in F. hal.); 1890a, 596; 1891b, 265.—Dies., 1850a, 316 (syn. Amphist. ser.).—Braun, 1892a, 586, 746, 751; 1893a, 903.—Giebel, 1857, 265.—Much., 1898, 19.—Nord., 1840, 616, 628 (syn. Amphist. ser.).—Linst., 1904, 254.—Looss, 1893b, 810.—Sieb., 1835, 66.

simplex Johnston, 1904, 112, pl. 7, figs. 1–3 (in Ardea novæhollandiæ Lath.).

spathaceum (Rud., 1819) Duj., 1845a, 375–376.—Baird, 1853a, 48.—Brand., 1888a, 12.—Crep., 1846, 139.—Dies., 1850a, 310 (to Hemist.).—Erc., 1881c, 54; 1882a, 290.—Nord., 1840, 628.—Stoss., 1898, 20.

spathula Crep., 1829, 50–54 (in Falco buteo, F. nisus, F. lagopus); 1839, 288; 1846, 129 (spelled spatula Dies., 1836, 240).—Brand., 1888a, 12.—Dies., 1850a, 309 (to Hemist.).—Duj., 1845a, 369–370.—Mehlis, 1831, 174–176.—Mol., ——.—Nord., 1840, 628 (spatula).—Stoss., 1898, 20.—Also reported for Strix brachyotus.

spatula Sieb., 1835, 57.—Dies., 1836, 240, for spathula.—Baird, 1853a, 48 (in Accipiter nisus).

spatulatum (Rud., 1819) Duj., 1845a, 376.—Brand., 1888a, 12.—Cobbold, 1876, 97.—Dies., 1850a, 367 (to Dist.).—Kowal., 1898 (to Echinost.).—Nord., 1840, 628.—Stoss., 1892, 186.

sphærocephalum (Westrumb., 1823) Dies., 1850a, 311 (in Coracina scutata; Brazil).—*Brand.*, 1888a, 65 (syns. Amphist. sph., Holost. westrumbii) (in Anas moschata); 1890a, 592–593, pl. 41, fig. 20.—Braun, 1893a, 903.—Wolffhuegel, 1900, *9, 60.*

HOLOSTOMUM—Continued.

sphærula (Rud., 1803) Duj., 1845a, 371–372.—Blochmann, 1892b, 650 (in Corvus cornix).—Brand., 1888a, 66 (syn. H. rotundatum) (in Corvus cornix, C. corone, Lanius collurio, Oriolus cristatus); 1890a, 593, 594, pl. 41, fig. 7.—Braun, 1893a, 904; 1894k, 681.—Crep., 1846, 132.—Dies., 1850a, 314 (in Corvus cornix, C. corone, C. frugilegus); 1858c, 321 (in C. glandarius).—Kowal., 1896d, 252 (2) (in Corvus cornix L.; Dublany); 1904, 23 (8) (in Garrulus glandarius).—Linst., 1877, 187.—Mol., 1858, 128; 1861, 196.—Mueh., 1898, 19.—Wolffhuegel, 1900, 9, 26, 33, 41.

squamosum Villot, 1878, 20–21, pl. 5, figs. 2–3 (in Strepsilas interpres).—Brand., 1888a, 18; 1890a, 577.—Linst., 1889.—Mont., 1888a, 23, 71.

tenuicolle (Westrumb, 1823) Dies., 1850a, 316 (in Falco rufus).—Brand., 1888a, 66 (in F. rufus); 1890a, 594, pl. 41, fig. 23.—Braun, 1892a, 586; 1893a, 904.—Also reported for Circus rufus.

unciforme (Rud., 1819) Brand., 1888a, 66; 1890a, 594 (in Oriolus cristatus).—Braun, 1893a, 904.

urniceps Schlotthauber, 1860, 129 (in Falco pygargus, int.).

urnigerum (Rud., 1819) Duj., 1845a, 378–379.—Baird, 1853a, 49 (syn. Codonocephalus mutabilis Dies.).—Brand., 1888a, 13.—Dies., 1836, 241; 1858c, 323 (of Wedl syn. of Co. mut., type Dies.).—Hannover, 1864a, 5.—Moul., 1856a, 219 (in Rana esculenta).—Sieb., 1835, 57.—Sons., 1893, 190 (syn. of Co. mut. Dies.).—Wedl, 1857, 255.

vaginatum Brand., 1888a, 64 (in Cathartes sp. by Natterer); 1890a, 591, pl. 41, fig. 24.—Braun, 1893a, 904 (Brazil).

variabile Nitzsch, 1819, 400, pl. 4, figs. 11–16 (in owls; Germany), syn. Amphist. macrocephalum Rud.; in Giebel, 1857a, 265 (in Strix aluco, Scolopax gallinula).—Baird, 1853a, 47 (=H. macroc. Blainv.).—Brand., 1888a, 5, 32, 63, 68 (in Strix aluco); 1890a, 561, 590, 596, pl. 41, fig. 1.—Braun, 1892a, 699; 1893a, 879, 881, 904; 1894k, 682; 1895b, 11.—Crep., 1839, 288.—Dies., 1850a, 312–313 (syns. Planaria teres poro simplici Gœze, Festuc. strigis Schrank, Fasc. strigis Gmelin, Strigea Abildg., Amphist. macrocephalum Rud., H. macrocephalum Crep.) (in Strix brachyotus, S. bubo, S. flammea, S. otus, S. aluco, S. passerina, S. tangmalmi, Falco tinnunculus, F. apivorus, F. albicilla, F. nævius, F. gallicus, F. lagopus, F. cineraceus, F. rufus, F. haliaëtos, F. buteo, F. peregrinus, F. pennatus, F. cyaneus, F. rufipes, F. imperialis); 1858c, 320 (syns. Amphist. macrocephalum Bellingham, 1844; H. macroc. Crep., 1849) (in Falco rufus, F. peregrinus, Ardea cinerea, Strix nyctea, S. pygmæa).—Giebel, 1857, 265.—Hoyle, 1890, 539.—Kastenbaum, 1899, 244, fig. 33, 7.—Kowal., 1896d, (2) 252 (in Buteo vulgaris Bechst; Dublany); 1904, (8) 23 (in Otus brachyotus; Dublany).—Linst., 1877, 187; 1903, 279; 1905, 191; 1906, 14 (syn. of H. macrocephalum).—Mol., 1858, 127; 1859, 818 (in Strix otus); 1861, 194–195, pl. 1, figs. 6–7.—Mueh., 1898, 16, 19.—Nord., 1840, 626 (syn. of Amphist. macrocephalum).—Par., 1887, 329–330; 1899, 4; 1902, 3–4 (in Aesalon regalus, Asio otus, Circus cyaneus; Elba).—Stoss., 1892, 66 (in Falco peregrinus; near Triest); 1895, 37 (in Circus æruginosus; Accipiter nisus at Triest; Syrnium aluco in Dalmatia); 1896, 126 (in Cerchneis tinnunculus; Staranzano); 1898, 21.—Villot, 1898, 542 (adult of Tetracotyle colubri).—Walter, 1866, 64 (A. macrocephalum Crep.).—Wedl, 1857, 252–253, pl. 1, fig. 18.—Wolffhuegel, 1900, 9, 11 (in Vultur calvus), 16, 17, 44.—Reported for Aegolius brachyotus, A. otus, Aquila albicilla, A. imperialis, A. nævia, A. pennata, Archibuteo vulgaris, Ardea cinerea, Astur nisus, Brachyotus palustris, B. variabilis, Bubo maximus, Buteo lagopus, Circaetus gallicus, Circus cineraceus, C. cyaneus v. hudsonius, C. rufus, Falco cyaneus, Nyctea nivea, Otus vulgaris, Pica caudata, Picus sp., Scolopax gallinula.

variegatum (Crep., 1825) Duj., 1845a, 376–377.—Brand., 1888a, 7, 63 (syn. H. platycephalum Duj.).—Baird, 1853a, 48.—Braun, 1893a, 844, 904; 1894, 166, 167; 1894k, 681.—Crep., 1846, 139.—Dies., 1850a, 315.—Duj., 1845a, 376–377 (in Larus maximus).—Mueh., 1898, 16, 19–20, fig. 9.—Villot, 1898, 542 (adult of Tetracotyle ovata).—Wolffhuegel, 1900, 9, 62.—Reported for Alca torda, Anas boschas, Carbo cormoranus, Colymbus rufogularis, C. septentrionalis, Falco albicilla, Fuligula nyroca, Harelda glacialis, Larus argentatus, L. marinus, L. ridibundus, Podiceps cristatus, Uria troile, Xema ridibundum).

westrumbii Cobbold, 1860a, 45 (Amphist. sphærocephalum Westrumb, renamed) (in Coracina scutata; Brazil).

HOMALOGASTER Poir., 1883, 74–76, 79 (m. paloniæ)(ὁμαλός=flat; γαστήρ=stomach); 1885, 120.—Braun, 1892a, 568, 581, 645, 663; 1893a, 879, 886, 890, 892, 895, 904, 906, 918.—Fischder., 1901, 374; 1902a, 7, 46, 47; 1903h, 489 (in Palonia frontalis); 1903h & i, 630–631 (diagnosis, type paloniæ).—Gamb., 1896, 73.—Hoyle, 1890, 539.—Looss, 1895, 11; 1896b, 17; 1899b, 541; 1902m, 440.—Mont., 1888, 7, 12, 14, 35, 91, 103; 1892, Oct. 7, 214 (gen. of Amphistominæ).—Piana & Stazzi, 1900, 523.—Pratt, 1902, 887, 892.—Shipley, 1905, v. 6 (1), 8.—Sons., 1895, 184, 186; 1896, 310.—Stiles, 1898a, 24.

paloniæ Poir., 1883, 74–76, pl. 2, figs. 1 a–b (t. h. Palonia frontalis; Java).—Braun, 1893a, 874, 907; 1893d, 466.—Fischder., 1901, 374; 1902a, (7) 47 (in Palonia frontalis; Java); 1903h, 630 (Dickdarm, Palonia frontalis; Java).—Giard & Billet, 1892a, 615.—Linst., 1889a, 21.—Sons., 1895, 184.—Stiles, 1898a, 24, 37, 72, 139, fig. 67.

poirieri Giard & Billet, 1892a, 615 (in cattle; Tonkin).—Fischder., 1901, 374; 1902a, 47–48 (in Bos taurus; Tonkin); 1903h, 630–631 (in Tonkin cattle).—Rail., 1893, 379.—Sons., 1895, 185.—Stiles, 1898a, 24, 67, 140.—Ward, 1895, 332 (in Bos taurus).

HOMALOMETRON Staff., 1904, May 3, 487 (m. pallidum); 'ομαλός, regular; μέτρον, mass.

pallidum Staff., 1904, May 3, 487 (t. h. Fundulus heterochitus L.; Woods Hole) (based on Lint., 1901, 422, pl. 32, fig. 354).

HOPLODERMA Cohn, 1903, 35–37 (m. mesocœlium).—Poche, 1907, 125 (Cohn not Michael, renamed Pintneria).

mesocœlium Cohn, 1903, 35–37, figs. 1–2 (in Draco volans; Eastern Java).

(HORMOCERCARIA) Dies., 1855a, 390, 394 (subg. of Cerc.) (type species echinata, or echinatoides) (corpus infra os collari echinis percurso cinctum).—Renamed (Nephrocephala), 1858.

echinata (Sieb., 1837) Dies., 1855a, 390–391; 1858d, 261. [See Dist. echinatum, type of Echinost.]

echinatoides (Fil., 1854) Dies., 1855a, 391–392; 1858d, 262. [Apparently type by elimination.] See, however, below, p. 385, Addenda.

HYDRICUCULUS McCrady, 1874a, 178 (m. cuculus, see sub Bucephalus) generic name abandoned by McCrady at date of publication.

HYPOSTOMA (Rud., 1809a, 36–37, 325–327) (nec Hypostomus Lac., 1803, fish) (type species probably caryophyllinum by Blainv., 1828a, 581); ὑπο, below; στομα, mouth; originally a subg. of Monost.; see also (Hypost.).—Blainv., 1824a, 518 (hypostome, "C'est un genre bien douteux, peut-être un degré de développement"); 1828a, 581.—Crep., 1839, 285.—Looss, 1902m, 830.—Nord., 1840, 623.—Olfers, 1816, 48.

caryophillinus (Rud., 1802) Blainv., 1828, 581.—Dies., 1850a, 328 (to Monost.).—Duj., 1845a, 360 (to Monost.).—Nord., 1840, 623 (to Monost.).

(HYPOSTOMA) Rud., 1809a, 36–37, 325–327, subg. of Monost. See Hypostoma.

caryophyllinum (Rud., 1802) Rud., 1809a, 325–326 (to Hypost. by Blainv., 1828, 581; returned to Monost. by Duj., 1845a, 360).

cochleariforme Rud., 1809a, 326–327 (= Festuc. cyprinacea Schrank, 1790, renamed) (in Cyprinus barbus).

gracile Rud., 1809a, 326 (t. h. Salmo eperlanus).

HYPOSTOMATA Rud., 1809a, 325, plural of Hypostoma.

ICHTHYDIUM Hemprich & Ehrenberg, 1828a (m. Cerc. podura Mueller; Nubia; Berlin), n. g. Ichthydinorum.

ITYOGONIMUS Luehe, 1899k, 538 (tod. ocreata Zed. = lorum Duj.; ἴτυς, margin, because of marginal position of genital pore); 1900, 557; 1901, 488.—Braun, 1900h, 6, 13; 1901i, 56; 1901, 897; 1902b, 129, 134.—Looss, 1900, 607; 1901, 206; 1902m, 755 (= Cucullanus Schrank), 839.—Pratt, 1902, 889, 907.

ocreatus (Gœze, 1782) Braun, 1902b, 135.—[Luehe, 1899, 538 (= Dist. lorum Duj.).]

KLEPSITROMIS Hammerschmidt in Leuck., 1835a, 88 (m. melolonthæ) "das aber viele Aehnlichkeit mit Distoma zu haben scheint."

melolonthæ Hammerschmidt in Leuck., 1835a, 88, a drawing in Vienna.

KÖLLIKERIA Cobbold, 1860a, 31 (m. filicolle) (not Agassiz, 1862; not Mingazzini, 1891, protozoon).—Braun, 1893a, 885, 886 (Kœllikeria), 894, 895, 908, 909, 911, 918; 1895b, 127, 136.—Gamb., 1896, 73.—Lint., 1901, 447.—Looss, 1899b, 536, 542, 543; 1901, 196.—Moniez, 1896, 83.—Mont., 1888, 92, 105; 1893, 149, 153, 154.—Pratt, 1902, 889, 908.—Schneidemuehl, 1896, 295.—Stiles & Hass., 1898a, 91, 98 (type Monost. filicolle Rud.).—Stoss., 1892, 4.—Tasch., 1879, 608.

1893: Kœllikeria Braun, 1893a, 886, for Köllikeria.

filicollis (Rud., 1819) Cobbold, 1860a, 31; 1879b, 462.—Ariola, 1906, 186, to (Dist.) (in Brama raii).—Braun, 1893a, 912.—Sons., 1890, 143 (in Brama raji).

okeni Ariola, 1906, 186 (syn. Dist. okeni Koell.), for okenii.

[staurocephali Mingazzini, 1891, protozoon.]

(KÖLLIKERIA) as subg. of Distoma. See also as genus.

dicorynum (Dies., 1850) Stoss., 1886, 47, as doubtful member of subg. (in Lampris guttatus).

filicolle (Rud., 1819) Stoss., 1886, 58.

LATIUSCULA Gœze, 1782a, 41, 169–173 (a "Klasse" of Plan. Gœze, containing: F. hepatica, Fledermausplattwurm, F. lucii, F. scorpii, F. luciopercæ, F. percæ cernuæ, F. serrulata, F. farionis, F. salmonis, F. varica, F. platessæ, F. blennii).

LECANE Nitzsch, 1827, 69 (contains Cerc. orbis, C. luna).

LECHRIORCHIS Staff., 1905, Apr. 11, 691 (m. primus) λέχριος, oblique; ὄρχις, testicle) (resembles Saphedera, Plagiorchis and Haplometra).

primus Staff., 1905, Apr. 11, 691 (t. h. Eutenia sirtalis L.; Canada) (includes Dist. sp. of Staff., 1902, 482).

LECITHASTER Luehe, 1901n, 395, 396 (tod. bothryophorus Olss. of Looss), 479–480.—Odhn., 1905, 357, 358, 359, 360, 366 (type confusus Odhn. by Odhn.).—Pratt, 1902, 889, 906.—Staff., 1904, 484.

bothryophorus (Olss., 1868 of Looss) Luehe, 1901n, 396, 480.—Odhn., 1905, 357 (botryophorus).—Staff., 1904, May 3, 484 (syn. Apoblema mollissimum Lev.) (in Salmo salar L., Clupea harengus L.).

botryophorus Odhn., 1905, 357, for bothryophorus, renamed confusus, 1905.

confusus Odhn., 1905, 357, 358, 359 (made type of genus by Odhn.) (syns. L. bothryophorus of Luehe, Dist. mollissimum Levin. of Stoss., Apoblema mol. Levin.), in intestine of Alosa finta of Mediterranean, and Clupea harengus of North Sea.

gibbosus (Rud., 1802) Luehe, 1901n, 480, in intest. of Belone acus, in Greifswald.—Odhn., 1905, 356–359 (syns. Fasc. gib. Rud., 1802, 81, pl. 2, fig. 7; Dist. gib. Rud., 1809a, 404, pl. 6, fig. 8; D. bergense Olss., 1868, 43, pl. 5, fig. 93; D. mollissimum Levin., 1881, 59, pl. 2, fig. 4; Lecithaster gib. Luehe, 1901, 480; [not Dist. botryophoron Olss., 1868, 42, pl. 5, fig. 92; not D. mollissimum Levin., of Stoss., 1889, 1–2; not Apoblema mollissimum (Levin.) Looss, 1896, 121, pl. 9, figs. 85–87]).—Nicoll, 1907, 72, 89–90 (syn. L. mollissimus) (in Ammodytes tobianus).

mollissimus (Levin., 1881) Nicoll, 1907, 89 (syn. of L. gibbosus).

LECITHASTERINÆ Odhn., 1905, 360, 364 (includes Lecithaster and Lecithophyllum).

LECITHOBOTRYS Looss, 1902h, 134, 135 (tod. putrescens).

putrescens Looss, 1902h, 135, 143, fig. 14 (in Mugil auratus).

LECITHOCHIRIINÆ Luehe, 1901n, 481 (includes Lecithochirium, Derogenes, and Lecithaster).

LECITHOCHIRINÆ Nicoll, 1907, 89, for Lecithochiriinæ.

LECITHOCHIRIUM Luehe, 1901n, 395, 396 (tod. rufoviride), 397, 401, 473–478, 479, 480, 484.—Odhn., 1905, 360, 362, 364; 1906, 59–66 (syn. Synaptobothrium).—Pratt, 1902, 889, 906.

caudiporum (Rud., 1819) Luehe, 1901n, 477–478.

conviva Luehe, 1901n, 474, 476 (in Conger conger; Coll. Berlin).

copulans (Linst., 1904) Odhn., 1906, 59–66 (syn. Synaptobothrium copulans Linst.).

digitatum (Looss, 1899) Luehe, 1901n, 396, 401, 474, 475, 478.

LECITHOCHIRIUM—Continued.

fusiforme Luehe, 1901n, 476, 480, 485, fig. 3 (in Conger conger; Coll. Berlin).—Odhn., 1905, 349.

grandiporum (Rud., 1819) Luehe, 1901n, 474, 477.

physcon Luehe, 1901n, 478 (in Lophius piscatorius; Triest).

ruforiride (Rud., 1819) Luehe, 1901n, 396, 474–475, 476, 477, 478.—Nicoll, 1907, 72 (in Anguilla vulgaris).—Odhn., 1905, 350, 355; 1906, 63.

LECITHOCLADIUM Luehe, 1901n, 395 (tod. excisum), 401–403, 474, 481, 485.—Cohn, 1902k, 47–68, 1 pl., 9 figs.—Nicoll, 1907, 84.—Odhn., 1905, 355, 356 (type excisum).—Pratt, 1902, 889, 906.

barbatum Cohn, 1902k, 47–54, 55, pl. 3, figs. 1–7 (in Coryphæna).

excisiforme Cohn, 1902k, 54–55, pl. 3, fig. 8 (in Scomber scomber).

excisum (Rud., 1819) Luehe, 1901n, 395, 398, 402, 403, 485, fig. 1.—Cohn, 1902k, 48, 54.—Odhn., 1905, 350.

tornatum (Rud., 1819) Luehe, 1901n, 403, 485, fig. 2.—Cohn, 1902k, 47, 48.

LECITHODENDRIINÆ Looss, 1902m, 815.

LECITHODENDRINÆ Luehe, 1901, 173.—Stoss., 1904, 198.

LECITHODENDRIUM Looss, 1896b, 86 (includes: Dist. glandulosum, D. hirsutum, D. chefrenianum, D. pyramidum, D. obtusum, D. sphærula, D. ascidia Rud., D. ascidia Ben. (=lagena Brand.), D. ascidioides, D. heteroporum (probably); 1898, 453; 1899b, 547, 548, 551, 609–610, type ascidia Ben. =lagena Brand., 611, 612, 613, 617, 618, 619, 621, 622, 625, 636, 718; 1901, 194, 199, 200; 1902m, 768–775, 813, 814, 815, 816, 818, 820, 821, 822, 823, 824, 827, 831, 832, 835.—Braun, 1900f, in 387–391; 1901, 948; 1902b, 150.—Jægers., 1900, 740.—Odhn., 1900, 12.—Luehe, 1899, 535, 536, 537.—Pratt, 1902, 889, 904.—Staff., 1903, 827, 828; 1905, Apr. 11, 684.—Stiles, 1901, 183, 185, 196, 197, 200, 201, 202, 203.—Stoss., 1899, 7, 8.—Ward, 1901, 176.

anticum Staff., 1905, Apr. 11, 693 (t. h. Vespertilio subtilis Say; Canada) (anticus, foremost in ref. to ovary in front of acetabulum).

ascidia (Ben., 1873 [not Rud., 1819]) Looss, 1899b, 609, or Stoss., 1899, 8.—Braun, 1900, 224–225; 1900, 388.—Heymann, 1905, 85.—Kowal., 1902d, 26 (8).—Looss, 1907, Mar. 5, 484 (of Looss, 1899b, 715, syn. of L. granulosum).—Staff., 1905, Apr. 11, 692.

ascidioides (Ben., 1873) Looss, 1899b, 609, or Stoss., 1899, 8 (intestino di diversi chirotteri; Belgium, France).—Braun, 1900, 388.—Staff., 1903, 828.

chefrenianum (Looss, 1896) Looss, 1899b, 716, or Stoss., 1899, 8 (in Rhinopoma microphyllum; Egypt).—Braun, 1900, 225.—Staff., 1905, Apr. 11, 692 (syn. of L. glandulosum).

chilostomum (Mehlis, 1831) Braun, 1900, 220–223, 224, 225, 228, 230.—Staff., 1903, 828; 1905, Apr. 11, 692 (Mehlis of Staff. with Dist. ascidioides Ben., of Staff., 1903, 827, renamed L. posticum).—Stoss., 1904, 1.

claviforme (Brand., 1888) Stoss., 1899, 9 (in Tringa alpina; Halle).

cordiforme Braun, 1900f (23. Juli), 389 (in Molossus sp.; Brazil), 390, or 1900b, 225–227, 228, 233, pl. 10, figs. 4, 11 (in Molossus sp.).

crassicolle (Rud., 1809) Stoss., 1899, 9 (in Anguis fragilis; Triest, Hameln; Salamandra atra, S. maculosa, Salamandrina perspicillata; Toscana).—Looss, 1902m, 822, 823.—Luehe, 1900, 562–563; 1901, 173.

glandulosum (Looss, 1896) Looss, 1899b, 609, 716–717, or Stoss., 1899, 8 (in Taphosus nudiventris; Egypt).—Braun, 1900, 388; 1900, 225, 226.—Staff., 1905, Apr. 11, 692 (syn. L. chefrenianum).

granulosum Looss, 1907, Mar. 7, 483–484, fig. 4a–b (in Vesperugo kuhli; Cairo, Egypt) (syn. L. ascidia of Looss, 1899b, 715).

heteroporum (Duj., 1845a) Stoss., 1899, 9 (in Vesperugo pipistrellus; Hameln, Rennes).

hirsutum (Looss, 1896) Looss, 1899b, 609, 625, 716, 717, or Stoss., 1899, 9 (intestino del camaleonte; Alessandria).—Braun, 1900, 225; 1900, 388.—Staff., 1905, Apr. 11, 692.

lagena (Brand., 1888) Looss, 1899b, 609, 625, 636, 715–716, 718 (i. e., ascidia Ben.) (type of Lecithodendrium).—Braun, 1900, 225.

macrolaimus (Linst., 1893) Stoss., 1899, 9 (in Vesperugo pipistrellus; Germany).

LECITHODENDRIUM—Continued.

nigrovenosum (Bellingham, 1844) Luehe, 1899, 535.—Rizzo, 1902, 28 (in Tropidonotus natrix).

obtusum (Looss, 1896) Looss, 1899b, 609, or Stoss., 1899, 8 (intestino del camaleonte; Alessandria).—Staff., 1905, Apr. 11, 692.

oviforme (Poir., 1886) Stoss., 1899, 8 (in Nycticebus javanicus).—Staff., 1905, Apr. 11, 692.

posticum Staff., 1905, Apr. 11, 692–693 (t. h. Vespertilio subtilis Say; Canada) (posticus=hinder) (syn. L. chilostomum Mehlis of Staff., 1903, 827) (=Dist. ascidioides Ben. of Staff.).

pyramidum (Looss, 1896) Looss, 1899b, 609, or Stoss., 1899, 8 (in Rhinolophus hippocrepis; Egypt).—Braun, 1900, 225; 1900, 388.

rubellum (Olss., 1868) Stoss., 1899, 9 (in Labrus maculatus).

somateriæ (Levin., 1881) Stoss., 1899, 8 (in Somateria mollissima; Greenland).—Jameson, 1902, 151–161 (Leveithodendrium).—Nicoll, 1906, 149 (Leucithodendrium).—Odhn., 1905, 311 (to Gymnophallus).

sphærula (Looss, 1896) Looss, 1899b, 609, 610, 621, or Stoss., 1899, 8 (in Rhinolophus hippocrepis; Egypt).—Braun, 1900, 225, 227; 1900, 388, 390.—Ward, 1901, 180.

urna Looss, 1907, Mar. 5, 485–486, figs. 5a–b (in Vesperugo kuhli; Cairo, Egypt).

LECITHODENDRUM Pratt, 1902, 903 (misprint for Lecithodendrium).

LECITHODESMUS Braun, 1902, 803 (m. goliath).—Odhn., 1905, 339, 344, 346, 347, 348.

goliath (Ben., 1858) Odhn., 1905, 342, 343, 344–346, 348, pl. 3, figs. 7–9, in Balænoptera rostrata, B. borealis.

LECITHOPHYLLUM Odhn., 1905, 359–360 (tod. botryophorum).

botryophorum (Olss., 1868) Odhn., 1905, 359 (in Argentina silus).

LECITHORCHIUM Lander, 1904a, 7, for Lecithochirium.

LEIODERMA Staff., 1904, May 3, 486 (m. furcigerum) (not Leioderma Will.-Suhm, 1873, worm) (λεῖος, smooth; δέρμα, skin); 1905, 310.

furcigerum (Olss., 1868) Staff., 1904, 486 (in Pseudopleuronectes americanus, Platysomatichthys hippoglossoides, Hippoglossoides platessoides, Cryptacanthodes maculatus).

LEPIDAPEDON Staff., 1904, May 3, 485 (m. rachion, from intest. of Melanogrammus æglefinus; Canada) (λεπίς, scale; δάπεδον, pavement). See Lepodora.

rachion (Cobbold, 1858) Staff., 1904, 485.

LEPIDOPHYLLINÆ Stoss., 1904, 198.

LEPIDOPHYLLUM Odhn., 1902, 68–69 (m. steenstrupi).—Pratt, 1902, 889, 902.

steenstrupi Odhn., 1902, 68–69, fig. 3 (in Anarrhichas minor s. pantherinus; Coll. Copenhagen); 1905, 310 (in A. lupus, Zoarces anguillaris).—Staff., 1904, May 3, 487 (in urinary bladder, Anarrhichas lupus L.; Canada, Zoarces anguillaris Peck; Canada).

LEPOCREADIINÆ Odhn., 1905, 328, 337.

LEPOCREADIUM Stoss., 1904, 200–201 (tod. album).—Odhn., 1905, 328, 336, 337–338.

album (Stoss., 1890) Stoss., 1904, 200 (in Cantharus orbicularis; Oblata melanura).—Odhn., 1905, 336, 338.

pegorchis (Stoss., 1901) Stoss., 1904, 200.—Odhn., 1905, 338.

LEPODERMA Looss, 1899b, Dec., 589–590, 592, 594, 595, 598, 599, 601 (tod. ramlianum) (orig. species: ramlianum, cirratum, mentulum, lima probably) (τὸ λέπος, scale; τὸ δερμα, skin); 1900, 558; 1900, 604, 607; 1907, Mar. 5, 483.—Braun, 1901i, 56, 58; 1901, 563; 1902b, 37 (syn. of Plagiorchis Luehe, 1899, 531).—Luehe, 1901, 487.—Stiles, 1901, 189.—Stoss., 1904, 2.

cirratum (Rud., 1802 [cirrhatum]) Looss, 1899b, 590.—Braun, 1902b, 43 (to Plagiorchis).

mentulatum (Rud., 1819) Looss, 1899b, 590.

ramlianum (Looss, 1896) Looss, 1899b, 589.

LEPODERMATINÆ Looss, 1899b, 588, 591, 594; 1901b, 207; 1902m, 839, 841.—Luehe, 1900, 561; 1901, 173.—Odhn., 1902, 40.

LEPODORA Odhn., 1905, 332–337, 338 (m. rachiæa=rachion Cobbold).—See Lepidapedon.

rachiæa Odhn., 1905, 328, 332–338, fig. 3, pl. 2, figs. 12–15 (syns.: Dist. rachion Cobbold, D. increscens Olss., pars) (in Gymnocanthus ventralis on west coast of Spitzbergen: Gadus æglefinus, G. morrhua, on west coast of Sweden: Merluccius vulgaris).—Nicoll, 1907, 71, 77–80, pl. 1, figs. 3–4 (in Gadus æglefinus).

LEPTALEA Looss, 1899b, 627–628 (tod. exilis) (not Leptalea Klug, 1839, hymenopt.) (renamed Emoleptalea Looss, 1900, 602) (λεπταλέος, thin, weak); 1900, 602.—Braun, 1902b, 69.—Stiles, 1901, 189.

exilis Looss, 1899b, 628, 719–720, figs. 37–38 (in Bagrus bayad; Cairo.)

LEPTOCOTYLE Mont., 1905, 70 (subg. of Pseudocotyle) tod. Pseudocotyle minor Mont.

LEPTOPHYLLUM Cohn, 1902h, 880 (m. stenocotyle).

stenocotyle Cohn, 1902h, 880–882, fig. 4 (in Herpetodryas fuscus; South America); 1903, 37.

LEPTOSOMA Staff., 1904, May 3, 484 (m. obscurum from Lophius piscatorius; Canada); λεπτός=slender; σῶμα, body) (not Leptosoma Leach, 1819, coleopteron; Risso, 1826, crustacean; Nardo, 1827, fish; Boisd., 1833, lepidopteron).

obscurum Staff., 1904, May 3, 484 (obscurus=unknown) (t. h. Lophius piscatorius; Canada).

LEUCERUTHRUS Marshall & Gilbert, 1905, 477, 481–483, 484 (m. micropteri).

micropteri Marshall & Gilbert, 1905, 481–483, figs. 8–14 (in Micropterus salmoides, M. dolomieu; near Madison, Wis.).

LEUCITHODENDRIUM Shipley & Hornell (see under L. somateriæ), 1904, 77, for Lecithodendrium.

somateriæ (Levin., 1881) Shipley & Hornell, 1904, 77.

LEUCOCHLORIDIA Cobbold, 1876h, 211, plural of Leucochloridium.

LEUCOCHLORIDIUM Carus, 1835a, 86–100 (m. paradoxum).—Ben., 1858a, 1861a, 219.—Braun, 1883a, 56; 1891c, 215; 1892a, 769, 771, 775, 801, 814; 1893a, 855, 884.—Burm., 1856a, 250.—Crep., 1839, 301.—Dies., 1850a, 287, 303 (syn. Vermis dubius helicis putris Rud.); 1855a, 397; 1858d, 276.—Duj., 1845a, 479.—Fil., 1855b, 25.—Goldb., 1855, 16.—Jackson, 1888, 651 (=Dist. macrostomum; in Succinea amphibia), 652.—Leuck., 1879, 99; 1886d, 75.—Looss, 1892, 128; 1894a, 245, 252.—Mont., 1888, 92, 94.—Moul., 1856a, 65, 87.—Pag., 1857, 6, 7, 9, 53.—Spengel, 1905, 258.—Stiles, 1901, 176.—Stiles & Hass., 1898a, 91, 95 (syn. of Urogonimus Mont.).—Tennent, 1906, 647, 650.—Vogt, 1878, 39.—Zeller, (1874), 564–578, pl. 48.

1893: Urogonimus.

macrostomum (Rud., 1803) Poche, 1907, 125.

paradoxum Carus, (1833a); 1835a, 86–100c (in Succinia amphibia, Helix putris; Saxony), pl. 7, figs. 1 —; —, 36.—[Ahrens, 1810, 292, pl. 9, figs. 12–19; 1818, 1467].—Bavay, 1902a, 200.—Braun, 1891c, 219; 1892a, 769, 772, 773, 806, 808; 1893a, 830, 855, 863; 1895b, 134.—Cobbold, 1879b, 436.—Crep., 1837, 325; —, 302.—Creutzberg, 1890a, 11.—Dies., 1850a, 303 (syn. Vermis dubius helicis putris Rud.); 1855a, 397 (in Succ. amph.); 1858d, 276–277 (syn. Cerc. exfoliata Moul.) (in Succ. amph.).—Duj., 1845a, 479.—Erc., 1881e, 55; 1882a, 291.—Gamb., 1896a, 65.—Heckert, 1887a, 456–461; 1887b, 603; 1888a, 49–50; 1889a, 66 pp., 4 pls.; 1889b, 357–362; 1890a, 42–43; 1891a, 189.—Hoyle, 1890, 540 (larva of Dist. macrostomum), fig. 4 C-D.—Leuck., 1863a, 521; 1879a, 95; 1886d, 72.—Looss, 1892, 120; 1894a, 236, 262; 1896, 140.—Mont., 1888, 76; 1892, Oct. 7, 187.—Moul., 1856a, 56, 65, 75, 87–90, 180 (Cerc. exfoliata), 181, pl. 5, bis, fig. 8; pl. 6, figs. 13, 14 (in Succ. amph.; Helix, Limax).—Nord., 1840, 548, 592, 631.—Piper, 1851, 313.—Poche, 1907, 125.—Rud., 1819a, 198, 568.—Schultze, (1871), 129.—Sieb., 1835, 77; 1835, 334; 1836, 49; 1853, 425–437, pl. 16 B; 1854, 14.—Steenstrup, 1842, 56; 1842, 103.—Stiles & Hass., 1898a, 95.—Tschudi, 1837, 75.—Vogt, 1852, 183, 191, fig. 66.—Wagener, 1857, 22, 23, pl. 33, figs. 1, 2–4.—Will.-Suhm, 1870, 4.—Zeller, 1874, 366–370; 1874, 20. Oct., 564–578, pl. 48; 1875, Feb., 162–164.

vogtianum Baudon, 1881, 145–147, pl. 5, fig. 5 (in Succinea baudoni Drouët).

LEUKOCHLORIDIUM Sieb., 1853, 425, for Leucochloridium.

LEVCITHODENDRIUM Jameson, 1902, 151, misprint for Lecithodendrium.

somateriæ (Levin., 1881) Jameson, 1902, 151–161, pls. 15–16.—Odhn., 1905, 311 (to Gymnophallus).

LEVINSENIA Stoss., 1899, 7, 9–10 (tld. brachysomum by Looss, 1899b, 622, and Luehe, 1899, 538) (not Levinsenia Mesnil, 1897, vermes).—Braun, 1900h, 6; 1900, 234.—Jægers., 1901, 982.—Looss, 1899b, 617, 620; 1902m, 703, 704, 705, 706.—Luehe, 1899, 538; 1900, 508; 1901, 488.—Odhn., 1900, 13; 1905, 314, 317.—Stiles & Hass., 1902d, 19–20 (renamed Levinseniella, type brachysoma); 1905, July, 54.—Ward, 1901, May, 175, 176 (Levinseniella Stiles), 181.

brachysomum (Crep., 1846) Stoss., 1899, 10.—Jægers., 1900, 736, 739 (brachysoma); 1901, 982.—Looss, 1899b, 620; 1902m, 704.—Ward, 1901, 175.

macrophallos (Linst., 1875) Stoss., 1899, 10 (in Actites hypoleucos, Totanus fuscus; Germany).—Looss, 1899b, 620.—Ward, 1901, 175.

opacum (Ward, 1894) Stoss., 1899, 9 (in Amia calva, Cambarus propinquus; Lake St. Clair; Ictalurus punctatus, Perca flavescens).—Looss, 1899b, 620.—Ward, 1901, 175 (type of Microphallus).

pygmæum (Levin., 1881) Stoss., 1899, 9, 10 (in Somateria mollissima; Greenland).—Jægers., 1900c, 732–740, figs. 1–3 (pygmæa); 1901b, 982 (type of Spelotrema).—Looss, 1899b, 620; 1902m, 705, 706, 784.—Nicoll, 1906, 522, 524 (pygmæa).—Odhn., 1900, 19, 20; 1905, 314 (to Spelotrema).—Ward, 1901, 175, 176.

pygmæa similis Jægers., 1900c, 737, figs. 1–3.—Luehe, 1900, 508.—Nicoll, 1906, 522.

similis (Jægers., 1900) Nicoll, 1906, 514, 519, 522–525, pl. 13, fig. 8 (syn. Spelotrema simile Jægers.) (in Hæmatopus ostralegus, Larus argentatus).

LEVINSENIELLA Stiles & Hass., in Ward, 1901, May, 176, 181, 182, 183, 184 (tod. D. brachysomum) (Levinsenia Stoss., 1899, not Mesnil, 1897, renamed); Stiles & Hass., 1902d, 19–20; 1905c, 54.—Jægers., 1901, 982; 1903a, 14, 15.—Looss, 1902m, 703, 704, 705, 706, 828, 830, 839.—Odhn., 1905, 314, 317, 318.—Pratt, 1902, 889, 902, 903.—Staff., 1905, Apr. 11, 684.

brachysoma (Crep., 1846) Stiles & Hass., 1902d, 20 (type).—Looss, 1902m, 705, 830, 831.

pygmæa (Levin., 1881) Staff., 1903, 824.—Type of Spelotrema 1901.

LINGUATULA Frœlich, 1789a, 148 (m. serrata) [an arachnoid, formerly placed among the trematodes].

caviæ (Bosc, 1811) Blainv., 1828a, 532.

crotali (Humboldt, 1808) Blainv., 1828a, 532.

denticulata Rud., 1805.—Dies., 1850a, 616 (to Pentast.).

integerrima Frœlich, 1791a, 104–105, host unknown.—Dies., 1850a, 412 (to Polyst.).—Rud., ———, 93, pl. 2, figs. 9a–f.—Type of Polyst.

lanceolata (Chabert, 1787a) Blainv., 1828a, 532.—Dies., 1850a, 610) syn. of Pentast. tænioides Rud.).

pinguicola (Treutler, 1793) Nordmann, 1840, 594.—Dies., 1850a, 410 (to Hexathyridium).

serrata Frœlich, 1789a, 148–150, pl. 4, figs. 14–15 (in hares).—Braun, 1903, 3. ed., 338 (larva of L. rhinaria).—Dies., 1850a, 616 (to Pentast.).

venarum (Treutler, 1793) Nordmann, 1840, 594.—Dies., 1850a, 410 (to Hexathyridium).

LINGULA L. ———.—Rafinesque, 1815, 151 (genus of Fasciolaria).

LINTONIA Mont., 1904, Dec. 1, 117–124 (tod. papillosa); 1905, 70; 1905, 117.

papillosa (Lint., 1898) Mont., 1904, 118–122, 123, pl. 7, figs. 1–7; 1905, 116–123, pl. 7, figs. 1–7 (in Gadus callarias).

LIOCERCA Looss, 1902m, 732 (type bonnieri), 839 (Liopyge, renamed).

1899: Liopyge Looss, 1899b, 642 (tod. bonnieri), not Liopygus Lewis, 1891, insect.

bonnieri (Mont., 1893) [Looss, 1902m, 732].

LIOLOPE Cohn, 1902h, 877 (m. copulans).

copulans Cohn, 1902h, 877–880, figs. 1–3 (in Cryptobranchus japonicus; died in Europe); 1903, 39, 40, 41, fig. 4a–c.—Linst., 1904, 254.

LIOPYGE Looss, 1899b, 642 (not Liopygus Lewis, 1891, 385, insect) (tod. bonnieri); λεῖος=smooth, ἡ πύγη=das Hintere; 1900, 604 (renamed Liocerca Looss, 1902m, 732, 839).—Luehe, 1901, 481, 485.—Pratt, 1902, 889, 901, 905.—Stiles, 1901, 189.

bonnieri (Mont., 1893) Looss, 1899b, 642; 1902m, 732.—Luehe, 1901, 481.

LOBORCHIS Luehe, in Stoss., 1902, 578–582 (tld. by Luehe mutabilis), subf. Allocreadiinæ.

fasciatum (Rud., 1819) Stoss., 1902, 582.

gobii (Stoss., 1883) Stoss., 1902, 582.

labri (Stoss., 1886) Stoss., 1902, 582.

mutabilis Stoss., 1902, 579–582, 1 fig. (in Anguilla vulgaris; Triest); **1903, 373.**

LOBOSTOME Blainv., 1824a, 518 (type Dist. laureatum Rud.) ("Ce sont les fascioles cylindriques dont la lèvre de la ventouse antérieure est lobée, comme le dist. laureatum de Rudolphi"). Only the French form of the name was used. See Crossodera.

LOPHOCERCARIA Dies., 1858d, 243 (m. fissicauda).

fissicauda Dies., 1858d, 243 (syn. Cerc. cristata Valette) (in Lymnæus stagnalis; L. palustris, Valvata piscinalis, Paludina impura, Planorbis submarginatus; Berlin & Turin).—Linst., 1878a, 324.

LOPHOCOTYLE Braun, 1896b, 3, 7 (m. cyclophora), Monocotylidæ.—**Mont., 1903,** 336 (Anisocotylinæ subf.); 1905, 68–70.—**Pratt, 1900, 646, 649, 650** (on skin of marine fishes), 655, fig. 19.—St.-Remy, 1898, 523, 540, 543.

cyclophora Braun, 1896b, 3, 7, figs. 1–3 (in Notothenia sp.; Navarin, Puerto Toro).—Pratt, 1900, 655, 657, fig. 19.—St.-Remy, 1898, 543–544, fig. 4.

LOPHOTASPIS Looss, 1901l, 7 Nov., 624–625 (m. L. adhærens Looss = Aspidogaster vallei (Stoss., 1899)); 1902m, 415, 418–430.—Pratt, 1902, 887, 892.

adhærens Looss, 1901l, 624–625 (in Thalassochelys corticata; Egypt); **1902m, 415,** 418 (syn. of L. vallei).

vallei (Stoss., 1899) Looss, 1902m, 415, 418–430, 442, 471, 791 (amphitypie) 868, pl. 21, figs. 1–9.—Odhn., 1902, 44.

LORIFORMIS Gœze, 1782a, 41 (= Fasc. intestinalis Linn., Fasc. abdominalis Gœze, Ligula), a "Gattung" of Fasciola Gœze.

LOXOGENES Staff., 1905, Apr. 11, 683 (m. arcanum); λοξός, bent sideways, oblique; γενάω, to produce).

arcanum (Nickerson, 1900) Staff., 1905, Apr. 11, 683 (in Rana catesbiana Shaw; Canada) (syns.: Dist. medians Olss. of Staff., 1900, 412; Dist. arcanum Nickerson, 1900, 811; Pleurogenes arcanum of Pratt, 1902, 959; Brandesia medians of Pratt, 1902, 959), 685.

LOXOSOMA Keferstein, 1862a, 131–132 (m. singulare).—Ben., **1869a,** 22 (syn. Cyclatella), a bryozoon, see also Braun, 1890a, 518.—Mont., 1888a, 88.—Tasch., 1879, 56.

annelidicola (Ben. & Hesse, 1863) Prouho, 1891, 91–116, pl. 5, figs. 1–16 (in Clyménien de Saint-Vaast, la Hogue).—Sons., 1895, 119.

singulare Keferstein, 1862a, 131–132, pl. 11, fig. 29 (λοξός, oblique; σῶμα, body) (Capitella rubicunda; St.-Vaast).

LYPEROSOMUM Looss, 1899b, 635 (for porrectum, plesiostomum, longicauda, clathratum); λύπερος, thin; tld. longicauda; 1902m, 770; **1907, Feb. 1,** 125.—Braun, 1901h, 702; 1901, 946; 1902b, 97, 106 (type longicauda), 119.—Odhn., 1902, 38.—Pratt, 1902, 889, 904.—Stiles, 1901, 190, 191.

corrigia Braun, 1901, 946 (in Tetrao tetrix); 1902b, 111, fig. 68.

lobatum (Rail., 1900) Braun, 1902b, 110, fig. 67.

longicauda (Rud., 1809) Braun, 1902b, 106, 111, fig. 65 (includes: Dist. longicauda Rud., 1809, 372; D. macrourum Rud., 1819a, 98; Linst., 1883, 309; 1886c; Dies., 1850a, 345; D. (Dicrocœlium) macrourum p. p. Stoss., 1892, 13; D. longicauda Much., 1896, 248, figs. 2, 9; Dicrocœlium longicauda Rail., 1900, 239).

rudectum Braun, 1901g, 946 (in Ibis cœrulescens Vieill.; Brazil); 1902b, 112, 113, fig. 69.

salebrosum Braun, 1901g, 946 (in Cypselus melba Ill.; Coll. Vien.); 1902b, 113, fig. 70.

squamatum Linst., 1906, 174, pl. 1, fig. 18 (in Dissura episcopus; Palatupana).

MACRASPIS Olss., 1868 or 1869, 2–3 (m. elegans) [nec McL., ante 1835, coleopteron].—Braun, 1893a, 879, 886, 887, 888, 890, 891, 894, 896, 898, 917, 918; 1893b, 188.—Gamb., 1896a, 73.—Looss, 1902m, 428.—Mont., 1888a, 84, 91; 1892, Oct. 7, 196, 198, 213 (gen. of Aspidobothridæ).—Nickerson, 1902, 602, 604, 606, 607, 612, 614, 615, 616, 617.—Odhn., 1902, 42, 43.—Pratt, 1902, 887, 891.—Tasch., 1879, 255.

[*calcarata* Spinola, 1835, 130–132, insect.]

MACRASPIS—Continued.

clegans Olss., 1868, 2-3 (in Chimæra monstrosa; Skagerrack).—Braun, 1893a, 875, 898; 1893d, 467 (in Ch. mon.).—Jægers., 1899b, 197-214, figs. 1-9 (anatomy).—Looss, 1902m, 420.—Mont., 1892, Oct. 7, 196; 1893a, 37.—Nickerson, 1902, 614, 618 (in Ch. mon.; Europe).—Tasch., 1879, 255.

MACROCERCUS Hill, 1752a, 8.—Mueller, 1773, 64.—Nitzsch, 1827, 68 (contains Cerc. gyrinus, C. gibba).

MACRODERA Looss, 1899b, 604 (tod. naja) (not Macroderes Westwood, ante 1882, coleopteron) (renamed Saphedera Looss, 1902, 732); *μακρός*, long; *ἡ δέρη*, neck; 1900, 605; 1902m, 732, 839 (syn. of Saphedera).—Luehe, 1900, 557, 561.—Odhn., 1902, 41.—Pratt, 1902, 888, 900.

naja (Rud., 1819) Looss, 1899b, 604; 1901, 658; 1902m, 732.—Luehe, 1900, 556.—Rizzo, 1902, 28 (in Tropidonotus natrix; Catania).

MACRUROCHÆTA Costa, (1864), 86-91 (? m. acalepharum).—Braun, 1889a, 364.—Par., 1894, 244.

acalepharum Costa, (1864), 86-91 (larva in Acalephen).—Mont., 1888, 77.—Par., 1894, 165 (syn. of Cerc. setifera Muel.) (in Beroe sp.; Naples), 481.

MALACOBDELLARII Mont., 1888, 94.

MALACOBOTHRIA Braun, 1893b, 188 (for Malacobothrii).

MALACOBOTHRII Burm., 1837, 529; 1856a, 243, 250.—Braun, 1890a, 515; 1893b, 188 (Malacobothria).—Mont., 1888a, 83.—Tasch., 1879, 233.

MALACOCOTYLEA Mont., 1892, Oct. 7, 213 (subo. of Trematoda); 1896, 162.—Braun, 1893a, 890, 891, 892, 895, 898 (Malacotylea), 917; 1893b, 188; 1895b, 136.—Gamb., 1896a, 73.—Looss, 1899b, 543.—Luehe, 1901, 488.—MacCallum, 1902, 636.—Maclaren, 1904, 579, 583, 599.—Much., 1898, 18.—Pratt, 1900, 645, 646, 647; 1902, 887, 891, 892 (includes: Paramphistomidæ, Fasciolidæ, Schistosomidæ, Holostomidæ, Gasterostomidæ, Didymozoonidæ, Monostomidæ).—Stiles, 1898a, 27.—Ward, 1903, 864.

MALACOTYLEA Braun, 1893a, 898, for Malacocotylea.

MALAKOKOTYLEA Schneidemuehl, 1896, 295, for Malacocotylea.

MALLEOLUS Ehrenberg, 1838a, 465 (m. furcatus).—Burm., 1856a, 250.—Dies., 1850a, 286, 294-295 (syns.: Vibrio Mueller, Cerc. Nitzsch, Histrionella Bory) (mentions only M. furcatus); 1855a, 379, 395; 1858d, 270, 274.—Fil., 1854a, 6; 1857c, 22.—Goldb., 1855, 16.—Moul., 1856a, 121, 123-124.—Pag., 1857, 4, 5.

furcatus (Nitzsch, 1817) Ehrenberg, 1838a, 465.—Dies., 1850a, 294-295 (syns.: Vibrio malleus Mueller, Zirkelthier Eichorn, Histrionella fissa Bory, Cerc. furcata Nitzsch, Cerc. 6 Baer); 1855a, 395; 1858d, 274 (syns. Cerc. furcata La Valette) (in Lymnæus stagnalis at Halle, Paludina vivipara at Berlin).—Moul., 1856a, 168 (to Cerc.).—Pag., 1857, 6.

MANODISTOMUM Staff., 1905, Apr. 11, 682-683 (m. occultum), *μανός* = rare.

occultum Staff., 1905, Apr. 11, 682-683 (in Diemyctylus viridescens Raf., Rana virescens; Canada) (=Dist. sp. Staff., 1902, 482); occultus=obscure.

MARMOSTOMUM Looss, 1900, 605 (misprint for Harmost. Braun).

MAZOCRAES Hermann, 1782a, 182 (m. alosæ).—Braun, 1890a, 518.—Cerf., 1896, 516.—Dies., 1850a, 421, 422.—Mayer, 1841a, 19.—Tasch., 1879, 239.—See Octostoma, Octobothrium.

1827: Octobothrium Leuck., 1827 or 28, 18 (lanceolata = alosæ, type by inclusion), not Octobothrium Dies., 1850a, cestode.

1829: Octostoma Kuhn, 1829, 358-363 (alosæ, type by inclusion).

1850: Octocotyle Dies., 1850a, 289, 421-422 (lanceolata = alosæ, type by inclusion).

1858: Octoplectanum Dies., 1858e, 382 (Octocotyle 1850 renamed hence alosæ type).

1894: Octocotyte Par., 1894, 594, misprint.

alosæ Hermann, 1782a, 182, pl. 4, figs. 13-14 (in Clupea alosa).—Ben., 1858a, 1861a, 46 (syn. of Octobothrium lanceolatum).—Nord., 1832a, 76 (syn. of Oct. lanc. Leuck., 1828).—St.-Remy, 1898, 545.—Tasch., 1879, 241, 244 (syn. of Oct. lanc.).

MEGACETES Looss, 1899b, 630-631 (tod. triangularis) (not Megacetes Thomas, 1859, coleopteron) (*μεγακήτης*=grossschlundig); 1900, Dec. 3, 602 (renamed Eumegacetes).—Braun, 1902b, 53, 92 (syn. of Eumeg.).—Odhn., 1902, 38.—Stiles, 1901, 189.

MEGACETES—Continued.

triangularis (Dies., 1850) Looss, 1899b, 596, 631, 725–727, figs. 44–46; 1902m, 819 (=Eumegacetes emendatus Braun, 1901).—Braun, 1901, 568; 1902b, 51, 54, 93, 97 (syn. of Eumeg. em.).—Luehe, 1900, 565.

MEGADISTOMUM Staff., 1904, May 3, 488 (m. longum) (*μέγας* = great), 489.

longum (Leidy, 1851) Staff., 1904, May 3, 488 (in Esox masquinongy Mit.; Canada).

MELANOGLENA Eichwald.—Dies., 1850a, 650.

bipunctata Eichwald, ——, 78, pl. 4, fig. 3.—Dies., 1850a, 650 (in aqua salsa, Revaliæ).

MERISTOCOTYLE Rossbach, 1906, 374 (for Merizocotyle).

MERIZOCOTYLE Cerf., 1894k, 936–948 (m. diaphanum) (*μερίζω* = je partage) Tristomidæ; 1894, 571–572; 1895, 697; 1895m, 130; 1896, 539, 540; 1898b, 329–366, pls. 13–14; 1899a, 448.—Brand., 1898a, 215 (23).—Mont., 1899, 98, 103; 1903, 336 (Anisocotylinæ subf.); 1905, 67, 68, 70.—Pratt, 1900, 646, 650.—Rossbach, 1906, 374 (Meristocotyle).—St.-Remy, 1898, 523, 540, 541–542.

1906: Meristocotyle Rossbach, 1906, 374, misprint.

diaphanum Cerf., 1894k, 936–948, figs. 1–6 (in Raja batis); 1894g, 949–954; 1895m, 129; 1895, 698–699; 1896, 539; 1898b, 329, 330–357, 358, 359, 360, 363, pl. 13, figs. 1, 3, 5, 8–11, pl. 14, figs. 1, 9 (in Raja batis).—Braun, 1896a, 1346.—Mont., 1899, 103.—Pratt, 1900, 655, 657, fig. 17.—St. Remy, 1898, 542, fig. 3.

minus Cerf., 1898b, 330, 357, 361, 363, pl. 13, figs. 2, 4, 6, 7 (in Raja sp.; Roscoff).—St.-Remy, 1898, 543.

MESAULUS Braun, 1902b, 23, 26 (m. grandis).

grandis (Rud., 1819) Braun, 1902b, 24, figs. 16–19 (syns.: Dist. grande Rud., 1819a, 676; Duj., 1845a, 446; Braun, 1901g, 564; Dies., 1850a, 346; Stoss., 1892, 2; D. convolutum (Brand.)).

MESOCOTYLE Par. & Perugia, 1889, Sept., 76–80 (m. squillarum), belongs between Dactylocotyle and Choricotyle.—Braun, 1890a, 546.—Cerf., 1895h, 920; 1896, 515.

squillarum Par. & Perugia, 1889, 76–80, 1 pl., figs. 1a–3a (in Bopyrus squillarum; Triest.).—Braun, 1890a, 549; 1891d, 421.—Cerf., 1898a, 302 (in Bop. sq.)—Stoss., 1898, 12.

MESOGONIMUS Mont., 1888, 15, 92, 105 (tod. Dist. reticulatum Looss, 1885; not Wright, 1879); 1892, Oct. 7, 214 (g. of Distominæ); 1893a, 82, 155–157, 177.—R. Bl., 1891, 609, 610; 1895, 730.—Braun, 1892a, 696, 735; 1893a, 885, 886, 890, 892, 909, 911; 1895b, 138; 1899g, 485; 1900, 25, 31; 1900h, 2, 3, 4, 5; 1902b, 68, 129.—Looss, 1894a, 171, 173, 174; 1896b, 59; 1899b, 536, 538, 539, 542, 585, 649, 650.—Luehe, 1899, 538, 539, 540; 1900, 557.—Moniez, 1896, 89.—Odhn., 1902, 42.—Stiles & Hass., 1898a, 86, 91 (type D. reticulatum Looss).—Stoss., 1892, 4, 5, 31; 1898, 24.

æqualis (Duj., 1845) Stoss., 1892, 174 (in Strix perlata, S. flammea; Rennes).—Mont., 1893, 156.

commutatus (Dies., 1858) Sons., 1889, 283; 1891, 201–202 (in Gallus dom., Meleagris gallopavo).—Hass., 1896a, 3 (syns.: Dist. dimorphum Wag., D. commutatum Dies., D. columbæ Mazzanti, Mesogonimus dimorphus (Wag.)) (in Gallus dom.).—Looss, 1894a, 174.—Mont., 1893, 156.—Rail., 1893a, 371 (=M. dimorphus (Wag.) Rail.).—Stoss., 1892, 175 (in Gallus dom., Pisa, Nizza; Meleagris gallopavo, Pisa).

compactus (Cobbold, 1859) Stoss., 1892, 31, 36 (in Mungos fasciatus).—Mont., 1893, 156.

constrictus (Leared, 1862) Mont., 1896, 32 pp., figs. 1–22; 1896, 141–172, pl. 7–8 (in Thalassochelys caretta).—Mingazzini, 1900, 156.—Mont., 1896, 141 pp., pls. 7–8 (in Th. car.).—Type of Hapalotrema, 1899.—See mistroides.

dictyotus Mont., 1893, 156, reticulatum Looss, renamed.

dimorphus (Wagener, 1852) Rail., 1890, 143; 1893a, 371.—Galli-Valerio, 1901c, 364 (in poule).—Hass., 1896a, 3 (syn. of M. commutatus (Dies.)).—Mont., 1893, 83, 156.

heteroclitus (Mol., 1858) Stoss., 1892, 174–175; 1892, 31–32.—Mont., 1893, 156.

heterophyes (Sieb., 1853) Rail., 1890, 143; 1890, 138; 1893, 370.—R. Bl., 1895, 737–739; 1900, 488.—Braun, 1903, 3 ed., 164 (to Cotylogonimus).—Manson, 1903, *3 ed., 664–665.*—Mont., 1893, 89, 156.—Stoss., 1892, 31–32 (in Homo; Cairo).—*Ward, 1895,* 328 (in Homo); 1903, 870 (to Heterophyes).

MESOGONIMUS—Continued.

linguæforme (Dies., 1850) Stoss., 1896, 127–128 (includes Dist. leptosomum Olss., D. caudatum Linst.); 1898, 24 (in Erinaceus europæus; Triest).

lorum (Duj., 1845) Mont., 1893, 156.

marginatus (Rud., 1819) Stoss., 1892, 175 (in Ardea sp.; Brazil).—Mont., 1893, 156.

pellucidus (Linst., 1873) Neumann, 1892, 374.—Dolley, 1894a.

pulmonale (Baelz, 1878) Stoss., 1892, 32–33 [type of Paragonimus Braun, 1899] (syns.: Dist. pulmonale, D. westermanni, D. ringeri) (in Homo; China, Japan, Korea, Formosa).

pulmonalis (Baelz, 1883) Rail., 1890, 143.—Looss, 1894a, 174.—Mont., 1893, 83, 89, 156.

[*reticulatus* (Looss, 1885).]

ringeri (Cobbold, 1880) Rail., 1890, 143 [=westermanii].

westermanni (Kerbert, 1878) Rail., 1890, 143; 1893, 369–370.—R. Bl., 1895, 739–740; 1895, 34–39; 1900, 488.—Braun, 1903, 3 ed., 155 (westermani) (to Paragonimus).—Mont., 1896, 168.—Vincent, 1890, 189.—Ward, 1895, 244, 328 (in Homo), 341 (in Canis familiaris); 1903, 867 (westermanii; to Parag.)

MESOMETRA Luehe, 1901d, 57–60 (tod. orbicularis), Monostomidæ.—Looss, 1902m, 442, 780, 813, 824, 838.—Pratt, 1902a, 890, 910.

brachycœlia Luehe, 1901d, 51, 55–57, 59, 60, figs. 4–5 (Monost. orbiculare of Par., e. p.) (in Box salpa; Genoa).—Looss, 1902m, 819.

orbicularis (Rud., 1819) Luehe, 1901d, 51–55, 56, 57, 59, 60, figs. 1–3.—Looss, 1902m, 819.

MESOTRETES Braun, 1900a, 229–230 (m. peregrinus).—Pratt, 1902, 889.

peregrinus (Braun, 1900) Braun, 1900, 229–230, pl. 10, fig. 3.

METASTATICA Leuck., 1889.—Braun, 1893g, 895, 900; 1893b, 188.—Gamb., 1896, 73.—Looss, 1899b, 543.—Ward, 1903, 865.

METORCHIS Looss, 1899b, 564–566 (includes: albidus (tod.), truncatus, complexus, conjunctus, crassiusculus, amphileucus, campula) (*μετὰ*, behind; *ὄρχις*, testicle); 1902m, 811.—Braun, 1902b, 5, 7, 9, 11.—Luehe, 1901, 474.—Pratt, 1902, 888, 896.—Rail., 1900, 242.

albidus (Braun, 1893) Looss, 1899b, 565.—Engler, 1904, 186.—Hollack, 1902a, 868.—Luehe, 1901, 171.—Stoss., 1904, 11.

amphileucus (Looss, 1896) Looss, 1899b, 565 (amphielucus); 1902m, 811.—Odhn., 1902, 152.—Stoss., 1904, 11.

campula (Cobbold, 1876) Looss, 1899b, 565.

cæruleus Braun, 1902b, 11, fig. 8 (in Cairina moschata; Brazil).—Stoss., 1904, 11.

compascua (Kowal., 1898) Kowal., 1902d, (5) 23 (in Anas querquedula; Dublany); 1904a, (8) 23.

complexus (Stiles & Hass., 1894) Looss, 1899b, 565.—Hollack, 1902a, 868.—Stoss., 1904, 11.

conjunctus (Cobbold, 1860) Looss, 1899b, 565.—Stoss, 1904, 11.

crassiusculus (Rud., 1809) Looss, 1899b, 565.—Braun, 1902b, 10.—Engler, 1904, 186.—Hollack, 1902a, 868.—Kowal., 1902d, 23 (5) (corrected to M. xanthosomus (Crep.) Braun, 1902) (in Anas boschas domestica).—Luehe, 1901, 171.—Stoss., 1904, 11.

poturzycensis (Kowal., 1898) Hollack, 1902a, 868.

tener Kowal., 1903, 517, fig. 1 (in Mergus merganser); 1904d, 19 (4) (in M. merg.).—Stoss., 1904, 11.

truncatus (Rud., 1819) Looss, 1899b, 565.—Braun, 1903, 3 ed., 160, fig. 108.—Engler, 1904, 186.—Hollack, 1902a, 868.—Odhn., 1905, 339.—Stoss., 1904, 11.—Ward, 1903, 864; 1903, 704.

xanthosomus (Crep., 1846) Braun, 1902b, 7, 10, figs. 4–7.—Kowal., 1903, 517; 1904d, 23 (8).—Stoss., 1904, 11.

MICROBOTHRIUM Olss., 1869, 3–5 (only positive, hence type species apiculatum), Tristomidæ.—Braun, 1890a, 516, 518.—Cerf., 1898b, 362.—Looss, 1894, 9.—Mont., 1888a, 84, 88; 1891, 127, 128; 1903, 336 (Pseudocotyle); 1905, 70.—Pratt, 1900, 649, 655, fig. 16.—St.-Remy, 1891, 213–223 (genital organs).—Tasch., 1879, 236 (syn. of Pseudocotyle); 1879, 49.

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apiculatum Olss., 1869, 4, fig. 13 (in Acanthias vulgaris; Skagerrack).—Braun, 1891d, 422; 1893b, 176, 178.—Cerf., 1898b, 341, 342.—Looss, 1894, 9.—Mont., 1888a, 88; 1891, 127.—Pratt, 1900, 655, 657, fig. 16.—St.-Remy, 1891, 213–223, 1 fig. (in Ac. vulg.).—Tasch., 1879, 49.

fragile Olss., 1869, 4–5, as doubtful sp. (in Raja batis; Norway).—Mont., 1888a, 88; 1891, 128.—St.-Remy, 1891, 213 (in Raja batis).—Tasch., 1879, 49.

MICROCOTYLE Ben. & Hesse, 1863; 1864, 96, 112 (either donavini or labracis should be type).—Ariola, 1899a: 1899 [in 129–138]; ——, 299.—Braun, 1890a, 414, 416, 426, 428, 445, 451, 454, 458, 468, 472, 477, 484, 485, 486, 489, 490, 494, 498, 499, 500, 511, 517, 523, 540, 546; 1891d, 422; 1893a, 890; 1896b, 7.—Cerf., 1895h, 918; 1896, 514; 1899a, 403.—Cunningham, 1887a, 278.—Gamb., 1896a, 73.—Goto, 1891a, 161, 169, 170, 178, 184, 186, 187; 1891c, 103; 1893a, 798, 799, 800, fig. 1; 1900, in 351–352.—Haswell, 1892a, 459; 1892b, 150; 1893e, 114.—Hoyle, 1890, 537, 539.—Ijima, 1884c, 638, 639.—Jackson, 1888, 642, 644, 645, 646, 647, 648, 654.—Juel, 1889, 33.—Kerbert, 1881a, 573.—Lint., 1901, 414, 451 (sp.); 1905, 335, 370, 385, figs. 147–150 (sp. on Cynoscion regalis, Pomatomus saltatrix).—Lorenz, 1878a, 405–436, pls. 31–33.—Looss, 1885b, 5, 10, 15, 17, 18; 1892, 72.—Maclaren, 1904, 595.—Mont., 1888a, 7, 8, 11, 15, 34, 40, 52, 53, 55, 59, 60, 66, 86, 89, 101; 1892, Oct. 7, 213 (gen. of Microcotylinæ); 1893, 110, 111; 1903, 336 (subf. Microcotylinæ).—Par. & Perugia, 1890, 175–219, 3 pls.; 1890, 13; 1896, in 135–138, 2 figs; 1896 in 4 pp.; ——, 653.—Pratt, 1900, 646, 650, 653, 655, 657, fig. 17, 660.—St.-Remy, 1898, 558–559.—Sons., 1891, 2 pp. (n. sp. in Umbrina cirrhosa).—Stoss., 1898, 14–15.—Tasch., 1879, 257; 1879, 40, 45, 46, 56, 58, 61, 62, 66, 69.

acanthurum Par. & Perugia, 1896, 2 (on Brama rayi; Genova).—Ariola, 1899, 5.—St.-Remy, 1898, 562.

alcedinis Par. & Perugia, 1890, 7; 1890, 744 (in Smaris alcedo; Genova).—Ariola, 1899, 4.—Braun, 1890a, 418, 541, 549, 552.—Goto, 1894a, 184.—Also reported for Mæna trachini, M. vulgaris.

canthari Ben. & Hesse, 1863; 1864, 113–114 (in Cantharus griseus).—Ariola, 1899, 4.—Braun, 1890a, 418, 541, 548, 550.—Lorenz, 1878a, 434.—Stoss., 1898, 15.—Tasch., 1879, 257 (in C. gr.)—Also reported for Cantharus brama, C. lineatus.

caudata Goto, 1894a, 186–187 (in Sebastes sp.; Mitsugahama).—Ariola, 1899, 4.—Heath, 1902, 117.—St.-Remy, 1898, 559.

chiri Goto, 1894a, 193–194 (in Chirus hexagrammus; Hakodaté).—Ariola, 1899, 4.—Heath, 1902, 117.—St.-Remy, 1898, 561.

chrysophryi (Ben. & Hesse, 1863) Braun, 1890a, 410 (chrysophrii), 418, 541, 548, 550.—Ariola, 1899, 5 (chrysophrii).—Linst., 1878a.—Mont., 1888a, 8 (chrysophrii).—Par. & Perugia, 1890, 8 (chrysophrii); 1894, 137 (in Chrysophrys aurata; Triest, Genova, Venice).—Stoss., 1891, 110; 1898, 15 (in Chr. aur.: Triest).—Tasch., 1879, 257 (in Chr. vulgaris).

donavani Mont., 1888a, 16, for donavini.

donavini Ben. & Hesse, 1863; 1864, 114–115, pl. 12, figs. 1–11 (in Labrus donavini).—Ariola, 1899, 4 (donavani).—Braun, 1890a, 410, 418, 498, 541, 548, 551.—Mont., 1888a, 16 (donavani).—Scott, 1905, 116–117, pl. 6, fig. 21 (in Lab. bergylta Ascan).—Tasch., 1879, 257 (in Lab. don.).

draconis Briot, 1904, Jan. 29, 126–127 (in Trachinus draco L.; Manche, North Sea).

elegans Goto, 1894a, 188–189 (in Scombrops chilodipteroides; Misaki).—Ariola, 1899, 4.—St.-Remy, 1898, 559–560.

erythrini Ben. & Hesse, 1863; 1864, 115–116 (in Pagellus erythrinus).—Ariola, 1899, 4.—Braun, 1890a, 418 (erythrinis), 453, 498, 541, 548, 551.—Par. & Perugia, 1890, 8; 1894, 136 (in Box boops; Genova).—St.-Remy, 1898, 546.—Tasch., 1879, 257 (in Pag. ery.).

erythrinis Braun, 1890a, 418 (for erythrini).

fusiformis Goto, 1894a, 192–193, pl. 2, fig. 3, pl. 4, fig. 6, pl. 5, fig. 1 (in Centronotus rubulosus; Mitsugahama).—Ariola, 1899, 4.—St.-Remy, 1898, 561.

hiatulæ Goto, 1899a, 281–282, pl. 21, fig. 29 (in Hiatula onitis; Newport, R. I.).

labracis Ben. & Hesse, 1863; 1864, 112–113, pl. 12, figs. 12–18 (in Labrax lupus).—Ariola, 1899, 4.—Braun, 1890a, 418, 443, 477, 488, 498, 514, 541, 548, 551.—Gamb., 1896a, 58, fig. 25c.—Mont., 1888, 8, 16, 66; 1893, 111.—Par. & Perugia, 1890, 8, 12; 1894, 136–137 (in Labrax lupus; Genova).—Scott, 1905, 117, pl. 6, fig. 23.—Stoss., 1898, 15–16.—Tasch., 1879, 257 (in Labrax lup.).

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lichiæ Ariola, 1899, 1–5, pl. 1, figs. 1–5 (in Lichia amia; Genova).

longicauda Goto, 1899a, 282–283, pl. 21, figs. 30–31 (in Cynoscion regale; Newport, R. I.).—Pratt, 1900, 657, 661, fig. 39.

mormiri Mont., 1888, 34, for mormyri.

mormyri Lorenz, 1878a, 425–434 (21–30), pl. 3, figs. 1–6 (on Pagellus mormyrus; Triest).—Ariola, 1899, 4.—Braun, 1890a, 410, 418, 443, 452, 477, 488, 541, 548, 551.—Goto, 1894, 184.—Hoyle, 1890, 539–540, fig. 3c.—Juel, 1899, 36.—Linst., 1889a.—Par. & Perugia, 1890, 745 (in Pagellus mormyrus); 1890, 8; 1894, 137 (Triest; Genova).—Mont., 1888, 10, 16, 30, 34 (mormiri), 66; 1893, 111.—Stoss., 1898, 16.—Tasch., 1879, 257 (in Pag. morm.; Triest); 1879, 35.—Ziegler, 1883, 546.

mugilis Vogt, 1878, May 7, 327–332, pl. 14, fig. 3 (in Mugil cephalus; Roscoff).—Ariola, 1899, 4.—Braun, 1890a, 514, 541, 548, 551.—Goto, 1894a, 183 (in M. ceph.).—Par. & Perugia, 1890, 4, 8, 12; 1894, 136 (M. ceph.; Genova).—Sons., 1891, 253–254 (mugylis) (in M. ceph.).—Tasch., 1879, 257 (in M. ceph.; Roscoff).

mugylis Sons., 1891, 253–254, for mugilis.

panceri Sons., 1891, 303–304 (in Umbrina cirrhosa; [?Pisa], Italy).—Ariola, 1899, 5.—Braun, 1893b, 184 (in Umb. cirr.).—Goto, 1894a, 184.

pomatomi Goto, 1899a, 278–279, pl. 21, fig. 27 (in Pomatomus saltatrix; Newport, R. I.).—Pratt, 1900, 660.

reticulata Goto, 1894a, 189–191 (in Stromateus argenteus; Mitsugahama).—Ariola, 1899, 5.—St.-Remy, 1898, 560.

salpæ Par. & Perugia, 1890, 207, pl. 5, fig. 34 (in Box salpa); 1894 (at Genova).—Ariola, 1899, 5.—Goto, 1894a, 184.—Sons., 1891, 262 (in B. sa.).

sargi Par. & Perugia, 1890, 4, 7, 11 (sargii); 1890, 744 (in Sargus rondeletii; Genova); 1894 (in Sargus rondeletii, S. annularis, S. salviani; Genova).—Ariola, 1899, 4.—Braun, 1890a, 418, 514 (sargii), 541, 549, 552.—Goto, 1894a, 184 (in Sargus annularis, S. rondeletii, S. vulgaris).

sargii see sargi.

sciænæ Goto, 1894a, 194–196 (in Sciæna sina; Mogi).—Ariola, 1899, 4.—Heath, 1902, 117.—St.-Remy, 1898, 561–562.

sebastis Goto, 1894a, 187–188 (in Sebastes sp.; Hakodaté).—Ariola, 1899, 4.—St.-Remy, 1898, 559.

stenotomi Goto, 1899a, 279–281, pl. 21, fig. 28 (in Stenotomus chrysops; Newport, R. I.).—Pratt, 1900, 660.

trachini Par. & Perugia, 1889, 744–745 (in Trachinus radiatus; Genova); 1890, 744–745; 1890, 7, 10.—Par., 1894, 136, 594, 595.—Ariola, 1899, 4.—Braun, 1890a, 418, 541, 549, 552.—Briot, 1904, 127 (in Tr. rad.).

truncata Goto, 1894a, 191–192 (in Pristipoma japonicum; Mitsugahama).—Ariola, 1899, 4.—St.-Remy, 1898, 560.

[ICROCOTYLIDÆ Tasch., 1879, 235, 237, 255; 1879, 69.—Braun, 1890a, 511, 516, 517, 523, 533, 540, 546.—Cerf., 1899a, 365, 452.—Hoyle, 1890, 539 (includes: Axine, Microcotyle, Gastrocotyle, Aspidogaster, Cotylaspis, Aspidocotyle).—Jackson, 1888, 654 (includes: Axine, Microcotyle, Aspidogaster, Cotylaspis).—Mont., 1888, 8, 10, 11, 13, 15, 16, 20, 30, 34, 37, 66, 86, 88, 89, 91, 101, 108; 1892, Oct. 7, 196, 197; 1903, 336 (raised from subf. to fam. rank; subf. Microcotylinæ (g. Microcotyle); 2. Axininæ (g. Axine, Pseudaxine, Gastrocotyle).—Par. & Perugia, 1890, 7.

[ICROCOTYLINÆ Mont., 1892, Oct. 7, 213 (subf. of Polystomidæ); 1903, 336.—Braun, 1893a, 890.—Gamb., 1896, 73.—Pratt, 1900, 646, 653 (includes: Microcotyle, Gastrocotyle, Axine, Pseudaxine).—St.-Remy, 1898, 558.

[ICROLISTRUM Braun, 1901f, 563 (tod. cochleariforme); 1902b, 55.—Pratt, 1902, 889.

cochlear (Dies., 1850) Braun, [1901f, 563;] 1902b, 58, 59, fig. 36 (syns.: Dist. cochleariforme p. p. Rud., 1819; Duj., 1845; Stoss., 1892, 37; D. cochlear Dies., 1850; Stoss., 1892; D. diesingi Cobbold, 1861).

cochleariforme (Rud., 1819) Braun, [1901f, 563;] 1902b, 56, 58, fig. 35 (syn. Dist. cochleariforme Rud., 1819; Duj., 1845; Dies., 1850; Stoss., 1892).

spinetum Braun, 1901f, 563 (in Rhynchops nigra L.; Brazil) (syn. Dist. attenuatum Brems. MS.); 1901, 895; 1902b, 56, 59, 60, figs. 37–39.

MICROPHALLINÆ Ward, 1901, 185.—Jægers., 1903a, 14.—Odhn., 1905, 318.—Pratt, 1902, 889, 903 (includes: Microphallus, Levinseniella).—Stoss., 1904, 198.

MICROPHALLUS Ward, 1901, 175–185 (m. opacus); 1902, 17 June, 361; 1903, v. 3, [71–83], 175–187, pl. 26, figs. 1–5.—Jægers., 1903a, 14.—Looss, 1902, 426.—Odhn., 1905, 317.—Pratt, 1902, 889, 903.—Staff., 1903, 824 —Stiles & Hass., 1902d, 20.

opacus (Ward, 1894) Ward, 1901, 184.—Staff., 1903, 824.

MICROPHARYNX Jægers., 1897a, 707–714 (m. parasitica) [an ectoparasitic triclade turbellaria].

parasitica Jægers., 1897a, 707–714, figs. 1–3 (on Raja clavata, R. lævis; Kattegat) (? syn. Microbothrium fragile).—Braun, 1900, 70.—Graff, 1904, 457.—Staff., 1904, May 3, 482 (syn. Pseudocotyle fragile Olss.) (on Raja lævis; Canada).

MICROSCAPHA Looss, 1899b, 668–669, 769 (tod. reticularis) [not Microscapha Le Conte, 1866, coleopteron] ἡ σκαφη=Kahn, Nachen; 1900, Dec. 3, 602 (renamed Microscaphidium).—Stiles, 1901, 189.

linguatula Looss, 1899b, 668, 766–767 (in Chelonia mydas; Egypt), 768, 772, 773, fig. 87.—Braun, 1901b, 38, 54, type of Polyangium 1902.

reticularis (Ben., 1859) Looss, 1899b, 668, 763–766 (in Chelonia mydas; Egypt), 767, 768, 770, fig. 81.

sagitta Looss, 1899b, 668, 770, 772–773, fig. 88 (in Chelonia mydas; Egypt).—Braun, 1901b, 38, 54, type of Octangium 1902.

MICROSCAPHIDIINÆ Looss, 1900, 605; 1902m, 696, 699, 841.—Pratt, 1902, 890, 909 (includes Microscaphidium, Deuterobaris).

MICROSCAPHIDIUM Looss, 1900, Dec. 3, 602 (Microscapha Looss, 1899, not Le Conte, 1866, renamed, hence type reticulare); 1901, 200; 1902m, 442, 630, 632, 634, 642, 643, 647, 649, 651, 652, 658, 660, 665, 666, 667, 668, 675, 677, 681, 684, 690–691, 694, 695, 696, 698, 699, 805, 811, 824, 879 (type reticulare).—Pratt, 1902a, 890, 909.

aberrans Looss, 1902m, 630, 677, 692–693, 697, 698, 879, 881, pl. 28, figs. 106, 117–121 (in Chelone mydas; Egypt).

linguatula (Looss, 1899) Looss, 1902m, 688 (to Polyangium as type), 694, 695, 696, 697, 698, 811.

parallelum Looss, 1901l, 622 (in Chelone mydas; Egypt); 1902m, 689 (type of Angiodictyum), 690, 696.

reticulare (Ben., 1859) Looss, 1901l, 622; 1902m, 630, 632, 662, 677, 689, 690, 691–692, 693, 694, 695, 696, 697, 698, 879, pl. 28, figs. 105, 107–116.

sagitta (Looss, 1899) Looss, 1901l, 621; 1902m, 627, 685 (to Octangium as type), 694, 695, 696, 811.

MICROSCAPHIINÆ Looss, 1899b, 667; 1900, 605.

MIMODISTOMUM Staff., 1904, May 3, 488–489 (m. augusticaudum) (μιμος=imitator).

augusticaudum Staff., 1904, May 3, 488–489 (in Lota maculosa Le S., Stitzostedion vitreum Mit.; Canada).

MIRACIDIUM Braun, 1892a, 776, refers to the trematode embryo; not used as generic name.

MONOCÆCUM Staff., 1903, 822 (m. baryurum).

baryurum Staff., 1903, 822–824, figs. 1–3 (in Necturus maculatus Raf.; near Montreal); 1905, 682.—Linst., 1905, 418, 422 (brachyurum).

brachyurum Linst., 1905, 418, 422, misprint for M. baryurum.

MONOCERCA Wedl, 1861, 478–479 (m. heterobranchi).

heterobranchi Wedl, 1861, 478–479, pl. 3, fig. 39 (in Heterobranchus anguillaris; Cairo, Egypt).—Brand., 1888a, 15, 52; 1890a, 578.—Braun, 1892a, 796.—Linst., 1879a.

MONOCERCÆ Dies., 1855a, 384; 1858d, 243.—Mont., 1888a, 94.

MONOCOECUM Linst., 1905, 418, 422, for Monocœcum Staff.

brachyurum Linst., 1905, 418, 422, for baryurum.

MONOCOTYLA Blainv., 1828a, 556, Trematode fam. name, includes: Axine, Branchiobdella, Capsala, Epibdella, Erpobdella, Geobdella, Glossobdella, Hippobdella, Iatrobdella, Ichthyobdella, Malacobdella, Nitzschia, Palæobdella, *Pontobdella*, Pseudobdella.

MONOCOTYLE Tasch., 1878, 573, 574 (m. myliobatis); 1879, 57, 68; 1879, 236.—Braun, 1890a, 412, 415, 442, 484, 511, 516, 517, 523, 530, 531; 1893a, 890; 1896b, 7.—Cerf., 1894, 947; 1898b, 362.—Gamb., 1896a, 73.—Goto, 1893a, 798; 1894a, 229.—Hoyle, 1890, 539 (only one species, myliobatis) (in Myliobatis aquila).—Jackson, 1888, 653.—Mont., 1888a, 13, 34, 66, 88, 98; 1891, 108; 1892, Oct. 7, 213 (g. of Monocotylidæ); 1903, 335 (subf. Monocotylinæ; f. Monocotylidæ); 1905, 69.—Pratt, 1900a, 646, 650, 656, fig. 21.—St.-Remy, 1898, 523, 541.—Stoss., 1898, 9.

ijimæ Goto, 1894a, 230–232 (in Trygon pastinaca; Aug., Hiroshima.)—Braun, 1896a, 1346.—Cerf., 1895m, 130; 1896, 539, 540; 1898b, 338, 341, 347, 352.—St.-Remy, 1898, 541.

myliobatis Tasch., 1878, 574 (in Myliobatis aquila; Naples).—Braun, 1890a, 418, 488, 494, 531, 548, 551.—Cerf., 1894, 948.—Hoyle, 1890, 539.—Linst., 1889.—Par. & Perugia, 1890, 6.—Par., 1894, no. 726, 1022, 1059, 1060.—Pratt, 1900a, 656, 657, fig. 21.—Sons., 1890, 173 (in My. aq.).—Stoss., 1898, 9.

MONOCOTYLEA Dies., 1850a, 288, 290, 331, 431 (tribus II of Bdellidea Blainv.), 649 (tribus I of Myzelmintha); 1858, 312, 329.—Braun, 1890a, 515.—Goldb., 1855, 17, 20.—Mol., 1858, 128; 1858, 288.—Mont., 1888, 83, 84.—Stiles & Hass., 1898a, 90, 91.—Tasch., 1879, 233, 234.—Weinland, 1859, 280.

MONOCOTYLIDÆ Tasch., 1879, 235, 236, 238; 1879, 68.—Braun, 1890a, 516, 517, 523, 526, 530; 1893a, 890; 1896b, 7.—Cerf., 1894, 946, 947, 948; 1898b, 361, 362; 1899a, 411.—Goto, 1899, 291.—Hoyle, 1890, 539 (includes: Calicotyle, Pseudocotyle, Monocotyle).—Jackson, 1888, 653 (includes: Calicotyle, Pseudocotyle, Monocotyle).—Mont., 1888, 15, 34, 86, 88, 97, 108; 1891, 108, 127; 1892, Oct. 7, 197, 213 (f. of Eterocotylea) (raised to fam. from subf. by Leuck.; contains: Pseudocotyle, Callycotyle, Monocotyle); 1903, 336 (includes subf.: Monocotylinæ (g. Monocotyle), Pseudocotylinæ (g. Pseudocotyle=Microbothrium), Calycotylinæ (g. Calicotyle), Anisocotylinæ (g. Anoplodiscus, Merizocotyle, Lophocotyle, Dionchus); 1905, 69, 70.—Pratt, 1900a, 646, 649 (includes: Monocotyle, Calicotyle, Lophocotyle, Dionchus, Merizocotyle, Microbothrium, Pseudocotyle).—St.-Remy, 1891, Dec., 480–481; 1891, Oct., 600.—Stoss., 1898, 8.

MONOCOTYLIDES St.-Remy, 1891, 225–227 (nervous system of); 1891, 480–481; 1891, 600; 1892, 1 Nov., 45–52, 2 figs. (anatomy of).

MONOCOTYLINÆ Gamb., 1896a, 73.—Mont., 1903, 335; 1905, 69.—St.-Remy, 1898, 522, 540.

MONOGENA Mont., 1888, 85, 95, 96 (for Monogenea).

MONOGENÆA Haswell, 1892a, 457, 458, 460; 1893e, 127, 145 (for Monogenea).

MONOGENEA Ben., 1858 (Monogénèse), see Brand., 1891d, 7, 9; 1894a, 305.—Braun, 1883a, 58; 1890a, 407, 473, 516, 517, 520, 522; 1891d, 421; 1893a, 888; 1893b, 187, 188; 1895b, 131, 136.—Carus, 1863, 477.—Cerf., 1894, 947.—Diesking, 1891, 245–276, 1 pl.—Gamb., 1896a, 73.—Goto, 1893a, 801.—Haswell, 1892a, 457, 458, 460 (Monogenæa); 1893e, 127, 145 (Monogenæa); 1892, 150.—Hoyle, 1890, 539 (includes: Tristomeæ, Polystomeæ).—Kath., 1894a, 144.—Kholodk., 1899a, 148–149.—Knoch, 1894a, 11.—Kofoid, 1899, 183.—Looss, 1892a, 116; 1893b, 819.—Mont., 1888, 85, 95, 96 (Monogena); 1903, 334.—Odhn., 1902, 42, 43, 44; 1905, 370.—Pratt, 1900a, 645, 646.—Tasch., 1879, 234.

MONOGENETICA Haswell, 1893e, 144, 145.

MONORCHEIDES Odhn., 1905, 319–320 (m. diplorchis).

diplorchis Odhn., 1905, 318–320, pl. 4, fig. 1 (in Lumprenus medius; off Kings Bay, west side of Spitzbergen.)

MONORCHEIDINÆ Odhn., 1905, 320.

(MONORCHIS) Mont., 1893, 149, subg. of Dist., 150, 151 [type by absolute tautonymy D. monorchis] [not Monorchis Bastian; not Monorchis[a] Clerc., 1902, cestode].—Braun, 1893a, 894.—Looss, 1902i, 115–122; 1902k; 1903n; 1905h.—Luehe, 1900, 489.—Odhn., 1905, 319, 320.—Stiles & Hass., 1898a, 91, 98 (type by absolute tautonymy monorchis).

pachysomum (Eysenhardt, 1829) Mont., 1893, 151.—Looss, 1902i, 199, type of Haplosplanchnus.

monorchis (Stoss., 1890) Mont., 1893, 151.

[a] Cestode species: cirrosa, crassirostris, dujardini, filum, hirsutum, penetrans, pseudofilum.

MONORCHIS (Mont., 1893, type monorchis.—Looss, 1902i; 1902k; 1903n; 1905h.

monorchis (Stoss., 1890; Looss, 1902i, 117, fig. 1) in Cantharus orbicularis, Oblata melanura: Triest).

parvus Looss, 1902i, 118, fig. 2) in Sargus annularis, S. rondeletii; Triest).

MONOSICHYA Braun, 1890a, 401. See Monossichya.

MONOSSICHYA Cosmovici, 1887, supergeneric (includes Monostomum).—Mont., 1888a, 84, see Monosichya.

MONOSTAMA Mégnin, 1890c, 88, 89, for Monostoma.

MONOSTOMA[a] Zed., 1800a, 16, 147–160 (Festucaria Schrank, renamed, hence type anatis).—Andral, 1829, 617.—Baillet, 1866b, 107.—Bellingham, 1844a, 335–336.—Ben., 1858a, 1861a, 69; 1870, 363; 1870c, 142.—Ben. & Hesse, 1864, 61.—Blainv., 1828a, 582.—E. Bl., 1847, 303–304.—R. Bl., 1888a, 541, 542.—de Bonis, 1882, 103.—Brand., 1888a, 12; 1892, 504–511 (revision).—Braun, 1883a, 52, 59; 1890a, 514, 515; 1892a, 681, 696, 710, 722, 748, 768, 769, 770, 772; 1893a, 872, 879, 884, 886, 887, 890, 893, 894, 895, 896, 913, 914, 918; 1895b, 121, 128, 134, 137, 154; 1901, 561.—Bremser, 1824, 132.—Burm., 1837, 530.—Carus, 1863, 479.—Cerf., 1894, 946; 1898b, 356 (sp. in Cygnus musicus).—Cohn, 1904, 235, 237.—Cosmovici, 1887a, 128, 129.—Crep., 1829, 1, 49 (Monostomum); 1839, 285.—Dav., 1877, 73.—Deslongchamps, 1824ee, 551, 555.—Dies., 1834a, 1231; 1850a, 287, 319–331 (syns. Cucullanus Mueller ["Cuculanus"], Festuc. Schrank, Fasc. Gœze, Amphist. Rud., Dist. Zed., Monost. Zed.), 400 (syn. of Amphist.), 411 (syn. of Notocotyle), 414 (syn. of Aspidogaster Baer), 609 (of Numan; syn. of Pentast.); 1855a, 380 (cf. Cheilost.), 384; 1855, 62; 1858e, 312, 324–329.—Duj., 1845a, 342–343.—Dunglison, 1893, 1174.—Eichwald, 1829a, 249.—Eiss, 1838, 23.—Fischer, 1840, 156.—Fischder., 1902a, 6.—Gamb., 1896a, 73.—Goldb., 1855a, 17, 27.—Gunther, 1858, 205.—Hahn & Lefèvre, 1884, 806 (of Rud.).—L'Herminier, 1826, 10.—Hoyle, 1890, 535, 539 (type mutabile).—Jackson, 1888, 644, 654.—Jægers., 1901, 979.—Joy, 1835a, 504.—Kholodk., 1898, 33, 34; 1899a, 153.—Kolenati, 1857, 11.—Kuech., 1855, 180.—Lamarck, 1816, 185–186.—Lamouroux, 1822a, 194.—Leuck., 1863a, 61, 66, 451, 524, 632–633; 1879, 78; 1886d, 34, 59, 64.—Linst., 1901, 2.—Looss, 1885b, 56; 1896b, 147; 1899b, 658; 1901, 192, 193 (ocreatum = Dist. lorum Meln.; verrucosum to Notocotyle; bombynæ=M. ellipticum= Dist. variegatum; mutabile=type of Cyclocœlum; prismaticum=type by elimination); 1902m, 562, 564, 566, 568 (prismaticum type after Looss, 1901, but a distome after Mont., 1892; mutabile type of Cyclocœlum Brand. in 1892; type of Monost. by elimination after Luehe, 1901; see also Looss, 1902m, 707; mutabile might be type, Looss, 1902m, 719), 700, 701, 702, 703, 707, 710, 719, 720, 721, 728, 729, 730, 746, 812, 813, 842.—Luehe, 1901, 174, 175; 1901, 481.—Mayer, 1841, 4.—Moniez, [1899a], 159.—Mont., 1888, 7, 11, 64, 69 (Monostumum), 71, 73, 83, 84, 93, 106; 1892c, 514–534, figs. 1–22 (sp. in Box salpa); 1892d, 23 pp., 22 figs.; 1892, 31; 1892, Oct. 7, 183, 189, 199 (syn. of Aspidogaster) (of Rud.), 214 (g. of Monostomidæ); 1892, 709 (Monostonum); 1893, 15, 25, 27, 105, 115.—Moul., 1856a, 12, 15.—Nord., 1840, 614, 622–623.—Olfers, 1816, 22, 48.—Par., 1887, 327.—Pratt, 1900a, 645; 1902a, 890.—Rail., 1891, 26.—Ratzel, 1868, in 19 pp.—Rud., 1809a, 5, 20–21, 36–37, 325, pl. 12, fig. 5; 1819a, 82, 340, 583.—Schneidemuehl, 1896, 295.—Schneider, 1866, 334.—Sieb., 1854, 20, 29.—Stiles, 1902s, 28.—Stoss., 1898, 63.—Tasch., 1879, 232, 233, 258 (syn. of Aspidogaster Baer); 1879, 611.—Villot, 1878, 19.—Vogt,

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[a] Monostoma represents a complicated case, so far as its type is concerned, and well represents "a ship without a rudder."

There can be no question but that Monostoma was a deliberate renaming of Festucaria 1788, the name being changed for purely subjective reasons. The fact that Zeder did not specifically mention the original species of Festucaria does not seem to bear upon the question, for he gave "die mir bekannten Arten," and he refers to the original reference of Festucaria: thus the case is similar to Tænia Linn., 1758a, renamed Alyselminthus Zed., 1800. In our opinion the type must be the same as that of Festucaria, and this has been fixed by elimination to Festucaria anatis. The question whether or not this is a species inquirenda can not, so far as we see, come up at present. A deliberate renaming deserves to be treated in only one way and, logically, we see only one way to treat it.

Hoyle (in 1890, probably 1888, possibly earlier) designated mutabile as type of *Monostoma*. Looss (1901) by elimination designated prismaticum as type.

Had Monostoma not been a case of renaming, we should accept Hoyle's designation.

MONOSTOMA—Continued.

1878, 9, 10.—Wagener, 1854, 10–11; 1883, 122.—Wallenstedt, 1847, 7.—Walter, 1892, 11 July, 248–250 (in intestine of turtle).—Wedl, 1855, 380, pl. 2a, fig. 14 (sp.).

1815: Monostomeus Rafinesque, 1815, 151, Festucaria renamed.

1829: Monostomum Crep., 1829, 1, 49, for Monostoma.

1888: Monostumum Mont., 1888a, 69, misprint.

1891: Monostoum Brand., 1891d, 19, misprint.

1892: Monostonum Mont., 1892, 709, misprint.

1904: Monostromum Linst., 1904, 254, misprint.

acreatum Stoss., 1892, 18, misprint for ocreatum.

aculeatum Linst., 1879b, 338 (in Testudo græca; loc. not given); 1889.—Brand., 1892, 509.—Braun, 1893a, 915; 1899, 630; 1901a, 13, 14.—Looss, 1899b, 567.—Luehe, 1899, 528.—Mont., 1892, 686, 687, 697, 705, 715.—Stoss., 1895, 224 (=Dist. linstowi Stoss.); 1898, 43 (in Test. gr.; Triest).

affine Leidy, 1858, 110–111 (t. h. Fiber zibethicus; U. S. A.); 1904a, 111.—Brand., 1892, 510.—Braun, 1893a, 875, 915; 1893d, 466 (in F. zib.); 1901e, 344.—Dies., 1859c, 425.—Mont., 1892, 685, 696, 697, 698, 703, 711.

album Kuhl & van Hasselt, 1822a; 1824a, 311 (in Chelonia midas; Iles des Cocotiers).—Braun, 1899b, 721, 723–724; 1901a, 38, 44, 45–48, 52.—Crep., 1846, 146.—Dies., 1850a, 325 (=M. trigonocephalum Rud.).—Looss, 1899b, 667, 756, 762 (type of Cricocephalus); 1902m, 531.—Shipley, 1900, 532.

alveatum Mehlis, in Crep., 1846, 142 (in Anas fusca, A. glacialis), 143 (in A. leucophthalma, A. mollissima, A. penelope), 144 (in Cygnus musicus).—Brand., 1892, 508.—Braun, 1893a, 879.—Cobbold, 1860a, 40.—Cohn, 1904, 229 (of Mueh., 1898) (syn. of M. alveiforme Cohn), 230.—Crep., 1846, 141, 142–144; 1851, 291.—Dies., 1850a, 331 (in Anas fusca, A. glacialis, A. marila, A. mollissima, A. musicus, A. penelope); 1858e, 328 (in Anas anser ferus).—Looss, 1899b, 662.—Mont., 1892, 38, 39, 41 (to Notocotyle); 1892, 706, 709.—Mueh., 1898, 19 (in Fuligula marila; Pillau); 1898, 31, 101–102, fig. 3.—Reported also for Anas bernicla, A. cinereus.

alveiforme Cohn, 1904, 230 (alveatum Mehlis of Mueh., 1898, renamed).

amiuri Staff., 1900, 402–403, fig. 2 (in swim bladder of Amiurus nebulosus); 1904, May 3, 495 (Canada).

angustum Schlotthauber, 1860, 129 (int. of Scolopax gallinago).

arcuatum Brand., 1892b, 507 (to Cyclocœlum) (in aquatic birds), 508.—Braun, 1893a, 915; 1899, 467.—Looss, 1899b, 660, 661.—Stoss., 1902, 5, 6, 21, to Cyclocœlum (syns. Monost. mutabile of Sieb., 1835, 49, pl. 1; Dies., 1858, 325; Dav., 1877a, lxxiii; Mueh., 1898, 31) (in Anas clangula; Berlin, supposed to be based on Brandes' orig. material) (also in Anas dom.; Berlin).

armatum Mayer, 1841a, 4, Echinorhynchus renamed.

asperum Nitzsch, in Crep., 1849a, 71 (in Anas fuligula); in Giebel, 1857, 265 (in Mergus albellus, Anas clangula).—Brand., 1892, 507.—Braun, 1893a, 871.

asperum Vaillant, 1863, 347–348 (in Siren lacertina).—Mont., 1892, 715.

attenuatum Rud., 1809a, 328–329 (t. h. Scolopax gallinago, ceca; Greifswald) (to Monost. (Monost.)); 1819a, 84.—Baillet, 1866b, 107.—Bellingham, 1844a, 336.—Brand., 1892, 508.—Braun, 1891, 90; 1891d, 434 (in Anas boschas); 1893a, 874, 879, 916.—Cobbold, 1860a, 40.—Crep., 1839, 285; 1846, 141–142, 144–145; 1849, 1, 71; 1851, 1, 290.—Dav., 1877a, lxxiii.—Dies., 1850a, 322–323; 1858e, 325 (in Anas tadorna, A. penelope, A. albifrons, A. marila).—Duj., 1845a, 350.—Hass., 1896a, 3 (syn. of Notocotyle verrucosum (Frœlich)).—Looss, 1896, 192; 1899b, 662, 663.—Luehe, 1898, 625.—Mol., 1859, 824–825 (in Anas clangula, A. clypeata, A. ferina, A. fuligula, A. fusca, A. musicus, Anser dom., Mergus merganser, M. serrator).—Mont., 1892, 38, 39, 41 (syn. of Noctocotyle verrucosum Frœlich); 1892, 706, 709.—Mueh., 1898, 31.—Nicoll, 1906, 515 (in Harelda glacialis).—Olfers, 1816, 48.—Rail., 1893a, 338 (of Mol.=M. mutabile Zed.), 340 (of Rud.=Notocotyle verrucosum).—Schlotthauber, 1860, 129.—Reported also for Anas glacialis, Anser cinereus, Cygnus musicus, Fuligula cristata, F. ferina, F. marila.

bijugum Miescher, (1838a), pp. 28, pl. 1; 1838b, 154–158.—Baird, 1853a, 45.—Ben., 1858a, 1861a, 179, 188, 198, 200, 201.—Brand., 1891b, 285.—Dies., 1850a, 321 (syn. of M. faba Bremser).—Nord., 1840, 616, 625 (syn. M. faba).—*Sieb., 1839, 160–162.*—Tasch., 1879, 608 (syn. of M. faba).

MONOSTOMA—Continued.

bipartitum Wedl, 1855, 378–380, 393, pl. 1a, figs. 11–13 (t. h. Thynnus vulgaris).—Ariola, 1902, 100, 101 (of Wagener, form 2, syn. of Didymocystis reniformis), 103 (of Wedl, and of Wagener, form 1, syn. of Didymost. bipartitum, type), 105 of Wagener, form 3, syn. of Didymocistis wedli).—Braun, 1892a, 573, 660; 1893a, 894.—Darr, 1902, 661.—Dies., 1858c, 327 (in Thyn. vulg.); 1859c, 426.—Gamb., 1896a, 71.—Leuck., 1863a, 453.—Mont., 1888a, 9, 93; 1892, 714.—Par. & Perugia, 1889 or 1890, 746 (syn. of Didymozoon thynni Tasch.); 1893, 2.—Stoss., 1898, 62.—Tasch., 1879, 72; 1879, 606, 611, 612 (syn. of Didymozoon thynni Tasch.).—Wagener, 1858, 250, 252–256, pl. 10, figs. 1–10 (in Thynnus vulgaris; Niceæ).

blainvillei Cobbold, 1860a, 39 (Monost. delphini Blainv., renamed) (in Delphinus dalei).—Mont., 1892, 712.

bombynæ Zed., 1800a, xvi, 151, 160 (t. h. Rana bombya, lungs; Europe); 1803a, 190.—Baird, 1853a, 53 (=Dist. variegatum).—Dies., 1850a, 322 (syn. of M. ellipticum Rud.).—Looss, 1894a, 71 (syn. of Dist. variegatum Rud.); 1901, 192.—Rud., 1809a, 333 (=M. ellipticum).

braunii Cobbold, 1860a, 43 (M. murænulæ Rud.) (in Coregonus murænula).

caouanæ Kollar, in Braun, 1901b, 23 (syn. of Enodiotrema megachondrum) (in Thalassochelys caouana=T. caretta).

capitellatum Rud., 1819a, 83, 343 (to Monost. (Monost.)) (t. h. Sparus salpa; Naples).—Barbagallo & Drago, 1903, 411 (in Box salpa; Catania).—Brand., 1892, 509.—Braun, 1891d, 421; 1892a, 765, 766, 784, 786; 1893a, 915; 1893b, 178, 179.—Carus, 1884, v. 1, 112, 122.—Cobbold, 1860a, 42 (in Box salpa, Scomber scombrus).—Creutzburg, 1890a, 21.—Dies., 1850a, 326; 1858e, 327 (in B. sal.).—Duj., 1845a, 360–361.—Fil., 1855b, 25.—Florance, 1866a, 5.—Kroyer, 1838–40a, 595 (in Scom. scom.).—Leuck., 1863, 491, fig. 166; 1879, 39, fig. 16; 69; 1886d, 30, 69, fig. 16.—Looss, 1899b, 669; 1902m, 730 (as possible type of Monost., if Rud., 1819, were taken instead of Linn., 1758).—Luehe, 1901, 59, 60.—Mont., 1892, 4–12; 1892, 16 (of Carus, 1884, 112, partim, Par., Setti, Stoss. = M. stossichianum Mont.); 1892, 685, 686, 687, 688, 689, 694, 695, 696, 697, 698, 699, 700, 702, 703, 704, 705, 716; 1893, 15, 24, 83, 84, 104, 115, 116.—Par., 1886, 5, 7; 1887, 489.—Setti, 1891, 4 (= M. stossichianum teste Mont.).—Stoss., 1883, 112, pl. 2, fig. 9 (= M. stossichianum teste Mont.); 1898, 64.—Wagener, 1857, 26, 27, 45, 101, pl. 19, fig. 5.—Will.-Suhm, 1873, 342.

caryophyllinum (Rud., 1802) Zed., 1803a, 189; to Monost. (Hypost.) by Rud., 1809a, 323.—Baillet, 1866b, 108.—Blainv., 1828a, [probably type of Hypost.].—Brand., 1892, 508.—Braun, 1893a, 915.—Bremser, 1824, 132, pl. 8, figs. 1–2.—Cobbold, 1858b, 156, pl. 31, figs. 2, 3 (in Gasterosteus aculeatus).—Crep., 1825a, 80; 1839, 285.—Dav., 1877a, lxxiii.—Dies., 1850a, 328 (in Gast. acul., Gyphiæ; Anas boschas dom., Berlin).—Duj., 1845a, 360.—Gurlt, 1838, 229.—Kroyer, 1838–40a, 187 (in Gast. acul.).—Lamarck, 1816b, 186.—Mont., 1892, 717 (caryophyllum).—Nord., 1840, 623.—Olfers, 1816, 48.—Rail., 1893a, 339.—Risso, 1826, 262.—Rud., 1809a, 325–326, pl. 9, fig. 5; 1819a, 82.—Sieb., 1839, 169.—Verrill, 1870, 179 (of Bremser).

caryophyllum Mont., 1892, 717 (for caryophyllinum).

cercatum Ben., 1858a, 1861a, 179 [possibly lapsus for — ? —].

cochleariforme Rud., 1809a, 326–327, 410 (Festuc. cyprinacea Schrank, 1790, renamed) to (Hypost.) (in Cyprinus barbus); 1819a, 82–83.—Brand., 1892, 507.—Braun, 1893a, 916.—Dies., 1850a, 329 (syns.: Festuc. cyp., Dist. punctatum Zed.) (in Barbus communis).—Duj., 1845a, 362.—Kroyer, 1846–53a, 333 (in Barbus fluviatilis Ag.).—Lamarck, 1816b, 187.—Mont., 1892, 685, 696, 698, 704, 716, 717.—Nord., 1840, 624 (syn. Festuc. cyp.).—Olfers, 1816, 48.—Stoss., 1890, 132.

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constrictum Dies., 1850a, 322 (t. h. Abramis brama; eye); 1855, 62, pl. 2, figs. 3–5; 1858c, 325.—R. Bl., 1888a, 542.—Brand., 1892, 511, to Diplostomulum.—Braun, 1893a, 871.—Kroyer, 1852–53a, 1223 (in Abramis brama L.).—Moniez, *1896, 154.*—Mont., 1888a, 7; 1892, 716, 717.—Sramek, 1901, 108 (see Dist. *retroconstrictum*).

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crenulatum Rud., 1809a, 328, to Monost. (Monost.) (t. h. Motacilla phœnicurus; Greifswald); 1819a, 84.—Brand., 1892, 510.—Braun, 1893a, 915.—Dies., 1850a, 327.—Duj., 1845a, 348.—Lamarck, 1816b, 187.—Mont., 1892, 713, 714 (in Lusciola phœnicurus).—Nord., 1840, 624 (in Mot. phœn.).—Olfers, 1816, 48.—Stoss., 1898, 23.

crucibulum Rud., 1819a, 83, 342–343 to (Monost.) (t. h. Muræna conger, M. cassini (M. myroides); Naples).—Dies., 1850a, 321–322; 1859c, 425, 437 (to Gasterost.).—Duj., 1845a, 363–364.—Kroyer, 1846–53a, 615 (in Anguilla conger L.).—Odhn., 1905, 305 (to Prosorhynchus).—Stoss., 1898, 60.—Tennent, 1906, 639, 640 (to Gasterost.).

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cyumbium Stoss., 1902, 7, for cymbium.

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delphini Dies., 1850a, 330 (in Delphinus dalei) based on Blainv., 1825a, 141 and 1825b, 212–214 (on Delphinus sp.; Havre).—Ben., 1870, 358.—Braun, 1893a, 870.—Cobbold, 1879b, 421.—Mont., 1892, 711.—See also M. blainvillei.

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expansum Crep., 1842, 327 (t. h. Aquila haliaëtos).—Brand., 1892, 508.—Braun, 1893a, 915.—Dies., 1850a, 321 (in Falco haliaëtos; Gryphiæ).—Duj., 1845a, 345–346.—Jægers., 1901b, 979–983, 1 fig. (to Tocotrema); 1902a, 356–357; 1903a, 1.—*Mont., 1895, 685,* 686, 694, 696, 697, 698, 699, 700, 703, 713, 714.

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faba Bremser in Schmalz, 1831, 11–16, pl. 6, figs. 1–9 (in Parus major, Silvia sibilatrix, Motacilla boarula); 1839b, 1–8, pl. 1, figs. 1–2.—Baird, 1853, 45.—Brand., 1892, 509.—Braun, 1892a, 567, 642, 747, 751, 784; 1893a, 877, 879, 894, 915; 1893d, 468.—Cobbold, 1860a, 38, to Wedlia.—Crep., 1839b, 1–8, pl. 1, figs. 1–2; 1839a, 285.—Dav., 1877a, lxxiii.—Dies., 1850a, 320–321 (syns. M. bijugum Miescher, Globularia Rolando) (in Fringilla spinus, F. canaria, F. domestica, Motacilla boarula, Parus major, Sturnus vulgaris, Sylvia sibilatrix, S. trochilus).—Duj., 1845a, 346–348.—Leuck., 1863, 453.—Linst., 1904, 254 (Monostromum).—Looss, 1893b, 810.—Mont., 1888a, 9, 18, 93; 1892, 697, 699, 704, 713, 714.—Mueh., 1898, 31.—Nord., 1840, 625 (syn. M. bijugum).—Par., 1887, 327–329, pl. 6, fig. 36.—Rail., 1898, Oct., 628–629 (in Garrulus glandarius).—Sieb., 1839, 160, 161.—Tasch., 1879, 608 (syn. M. bijugum Miescher).—Reported also for Cyanocitta cristata, Emberiza cirlus, Ficedula sibilatrix, F. trochilus L., Saxicola œnanthe, Motacilla alba, Passer domesticus, Sylvia sp.

filarinum (Ben., 1858) Dies., 1859c, 426–427, as sp. inq.—Mont., 1893, 137.—Reported for Sciæna umbra.

filicolle Rud., 1819a, 85–86, 347–348 (t. h. Brama raji (Sparus raji); Naples) to (Monost.).—Ariola, 1906, 184; 1906, v. 30, 185–186.—Ben., 1858a, 1861a, 104, 105 (to Dist.).—Braun, 1892a, 572.—Cobbold, 1860a, 31 (type of Köllikeria).—Dies., 1850a, 359 (syn. of Dist. okenii).—Duj., 1845a, 361.—Kroyer, 1838–40a, 219, 594 (in Pagellus centrodontus Cuv., Brama raji Bl.).—Mont., 1893, 150.—Stiles & Hass., 1898a, 91, 98.—Tasch., 1879, 608.

filigerum Rud.—Risso, 1826, 262 (de la castagnolle).

filum Duj., 1845a, 362 (t. h. Scomber scombrus).—Ben., 1870c, 140, 141,142.—Braun, 1892a, 660, 784, 786.—Dies., 1850a, 327; 1858c, 328 (in Exocœtus exsiliens).—Kroyer, 1838–40a, 595 (in Sc. sc.).—Leuck., 1863a, 490.—Mont., 1888, 72; 1892, 716.—Mueller, 1894, 121–122 (in Ex. evolans, E. exiliens).—Par., 1894, 168.—Par. & Perugia, 1893, 1, 2, 3, of Wagener (syn. of Didymozoon exocœti).—Wagener, 1854, 10; 1857, 25, 52.—Reported also for Brama rayi.

flavum Mehlis, 1831, 172 (t. h. Anas mollissima, A. fusca, A. marila, A. fuligula).—Baillet, 1866b, 96, 107.—Ben., 1858a, 1861a, 171.—Brand., 1892, 507.—Braun, 1892a, 587, 673, 764, 768, 784, 785, 786, 788, 805; 1893a, 858, 866, 873, 876, 915; 1895b, 17; 1899, 467; 1902b, 20.—Cohn, 1904, 229 (syns.: Typhlocœlum Stoss., Cycloccelum Brand.).—Crep., 1837, 314, 324.—Dies., 1850a, 324; 1858d, 245; 1858e, 325–326 (adult in Anas mollissima, A. fusca, A. marila, A. fuliginosa, Mergus albellus, M. serrator, young in Fringilla dom., larva in Planorbis corneus).—Duj., 1845a, 355.—Gamb., 1896a, 72.—Leuck., 1863a, 491, 515.—Levin., 1881a, 57.—Linst., 1873, 1 (young, Glenocerc. flava); 1903, 279.—Looss, 1899b, 660.—Magalhães, 1899, 259, 260.—Mont., 1888a, 73, 76; 1892, 17–28; 1892, 683, 685, 686, 687, 696, 697–698, 699, 700, 704, 706, 707–708, 709–710, 711, 713, figs. 3, 7 (syn. M. cymbium Dies.) (in Anas fuliginosa, A. fusca, A. marila, A. mollissima, Himantopus wilsonii, Mergus albellus, M. serrator).—Moul., 1856a, 23, 207, 208.—Mueh., 1898, 31.—Nord., 1832a, 85, 93; 1840, 617.—Par., 1896, 2.—Schneidemuehl, 1896, 303.—Sieb., 1835, 66, 82.—Ssinitzin, 1905, 158–159; 1906, 687.—Stoss., 1902, 2, 5, 6, 7, 9, 18 (of Par. syn. of Cycloccelium robustum Stoss.), 28, 30, 31 (of Mehlis to Typhlocœlum), 33 (of Maghalhães, syn. of Typhlocœlum sp.).—Also reported for Fuligula marila, Grus cinerea.

foliaceum Rud., 1819a, 83, 340–342 (t. h. Accipenser sturio; Arimini) to (Monost.).—Blainv., 1828a, 582.—Braun, 1889i, 440; 1891d, 421; 1894a, 1147.—Bremser, 1824a, 132; 1824c, pl. 8, figs. 3–7.—Dies., 1836, 240; 1850a, 319–320 (in Accipenser sturio, A. glaber, A. stellatus); 1858e, 324 (in Acipenser sturio, A. nasus); 1859c, 425 (syn. Amphilina foliacea Wagener).—Duj., 1845a, 364.—Grimm, 1871, 499–502.—Kroyer, 1852–53a, 778 (in Acip. stu.).—Macé, 1882, 64.—Mol., 1858, 128; 1861, 197.—Mont., 1892, 2.—Nord., 1840, 625.—Salensky, 1874, 16 Sept., 291–292, pls. 28–32.—Villot, 1876, 1345; 1878, 16.—Wedl, 1855, 380–382, 394, pl. 2a, fig. 15; 1855, 399–400, pl. 1b, fig. 6.—Also reported for Acipenser guldenstädtii.

galeatum Rud., 1819a, 86, 349–350 (t. h. Centronotus glaucus; Naples) to (Monost.).—Braun, 1893a, 915.—Dies., 1850a, 327. Duj., 1845a, 362.—Mont., 1892, 685, 686, 697, 698, 699, 702, 703, 704, 716.—Stoss., 1887, 90; 1898, 62.—Reported also for Lichia amia, L. glauca.

gemellatum Mont., 1892, 716, for gemellum.

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gemellum Steenstrup, 1860, 113 (in Sphyræna barracuda).

geminum Bremser, in Schmalz, 1831, 13 (for M. faba Bremser).—Baird, 1853a, 45 (= M. faba).

gibbum Mehlis in Crep., 1846, 137 (t. h. Fulica atra).—Also reported for Gallinula chloropus.

gracile Rud., 1809a, 326 (t. h. Salmo eperlanus) to (Hypost.); 1819a, 82.—Brand., 1892, 508.—Dies., 1850a, 328–329.—Duj., 1845a, 363.—Kroyer, 1846–53a, 20 (in Osmerus eperlanus L.).—Lamarck, 1816b, 186–187.—Mont., 1892, 717.—Nord., 1840a, 623–624.—Olfers, 1816, 48.—Stoss., 1902, 5.

gurltii Cobbold, 1860a, 42 (in Lacerta agilis) (includes: M. sp. Gurlt, M. lacertæ Dies., Dithyridium lacertæ Valenc., D. lacertæ viridis Rud., D. lacertæ muralis Rud., Petrathyrus obesus Crep., Piestocystis dithyridium Dies.).

hepaticum suis Willach, 1893, 40–42; 1893, 26 Sept., 438; 1893, Mar., 124; 1894 (IV, 2), 874.—Braun, 1894g, 128–129 (= Cysticercus tenuicollis); 1894h, 755.—Stiles, 1898a, 28, 96.

himantopodis Rud., 1819a, 87 (in Charadrius himantopus; Cat. Mus. Vien.).—Dies., 1850a, 323 (syn. of M. mutabile Zed.).—Mont., 1892, 707.—Stoss., 1902, 1.

hippocrepis Dies., 1850a, 324 (t. h. Hydrochœrus capybara; Brazil); 1855, 63, pl. 2, figs. 6–9; 1858e, 326.—Brand., 1892, 508.—Braun, 1892a, 568, 584, 709; 1893a, 874, 915; 1901b, 344–346, pl. 19, fig. 10.—Looss, 1902m, 610.—Mont., 1888, 54; 1892, 685, 686, 694, 695, 696, 697, 698, 700, 703, 704, 711.—Also reported for Cavia capybara.

histrix Mol., 1858, 128 (t. h. Pelophylax esculentus; Patavii); 1861, 197–198, pl. 1, fig. 12.—Braun, 1892a, 583 (hystrix); 1893a, 881, 916.—Dies., 1858e, 328 (in Pel. esc.).—Mont., 1892, 685, 697, 698, 699, 700, 702, 705, 715, 716 (hystrix).—Par., 1894, 168.

holostomoides Mehlis in Crep., 1846, 138 (t. h. Colymbus cristatus).—Brand., 1892, 509.—Braun, 1893a, 915.—Cohn, 1904, 230.

hyalinum Schlotthauber, 1860, 129 (in Machetes pugnax).

hystrix Brand., 1892, 506 (in Rana esculenta), for histrix.

idi Rud., 1819a, 87 to (?Hypost.) (t. h. Cyprinus idus).—Dies., 1850a, 414 (syn. of Aspidogaster limacoides Dies.).—Mont., 1892, Oct. 7, 202 (syn. of Asp. lim.).

ignotum Nicoll, 1906, 514 (in Hæmatopus ostralegus), sp. inq.

impudens Crep., 1846, 149 (t. h. Squalus griseus).

incommodum Leidy, 1856, 43 (t. h. Alligator mississippiensis: Florida); 1891a 414, (to Dist.) 1904a, 85.—Brand., 1892, 510.—Braun, 1893, 872, 915.—Cobbold, 1860a, 42.—Dies., 1858e, 329 (in All. miss.).—Mont., 1892, 714, 715.—Pavesi, 1881, 294.—Will.-Suhm, 1870, 11.

isabellinum Ratzel, (1868), 153, t. h. Gadus æglefinus.—Linst., 1878a, 223 (=Rhipidocotyle gracilescens (Rud.)).—Stoss., 1898, 61.

kuhni Cobbold, 1860a, 39 (M. leporis Kuhn, renamed) (in Lepus cuniculus).—Rail., 1893a, 339 (= M. leporis Kuhn).—See Cysticercus pisiformis.

lacertæ Dies., 1850a, 331 (t. h. Lacerta agilis) (syn. Dist. ammon); for M. sp. Gurlt, 1838, 229; 1858e, 328 (syn. Tetrathyrus obesus; cf. Piestocystis dithyridium Dies., 1850a, 495).—Crep., 1851, 1, 192.

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ventricosum (Rud., 1802) Rud., 1809a (ventricolum, p. 334), 335–336, 339; to (Monost.); 1819a, 86 (in Motacilla luscinia; Gryphiæ).—Brand., 1892, 509.—Braun, 1893a, 876, 916.—Dies., 1850a, 328 (syn. Festucaria vent.).—Duj., 1845a, 348–349.—Mont., 1892, 713, 714.—Olfers, 1816, 48.

MONOSTOMA—Continued.

verrucosum (Frœlich, 1789) Zed., 1800a, xvi, 150, 155–159.—Anacker, 1887c, 513.—Baillet, 1866b, 107 (syn. M. triseriale).—Baird, 1853a, 45.—Bellingham, 1844, 336.—Ben., 1858a, 1861a, 72, 77–81, 179, 189, 190, 193, 197 (syns. Fasc. ver., F. anseris, Festucaria pedata, Notocotyle triseriale, Notocotylus triserialis) (in Anas tadorna).—Ben., 1859, 77–80.—E. Bl., 1847, 304–308, pl. 13, fig. 2.—Brand., 1892, 508.—Braun, 1891d, 421; 1892a, 709, 762, 764; 1893a, 874, 891; 1893b, 177, 185; 1893d, 468; 1901b, 39.—Cobbold, 1872b, 90; 1877, 238; 1879b, 41, 440.—Crep., 1839, 285; 1846, 141.—Dies., 1839, 234; 1850a, 411 (syn. of Notocotyle triseriale Dies.); 1858c, 369 (syn. of Notocotyle triserialis Dies.) (in Anas anser dom. et ferus, Hæmatopus ostralegus, Fulica atra); 1859c, 437 (syn. of Notocotyle triserialis) (in Anas tadorna, Planorbis, Lymnæus; Belgia).—Duj., 1845a, 355–358, pl. 8, fig. B.—Hass., 1896a, 3 (to Notocotyle).—Hoyle, 1890, 539 (=Notocotyle triseriale).—Jackson, 1888, 642.—Lamarck, 1816b, 187.—Levinsen, 1881a, 78 (in Somateria mollissima).—Looss, 1896b, 146–153, 192–197, 228, pl. 10, figs. 94–100, pl. 14, figs. 146–151 (in Canard dom.; Alexandria) (syns.: Notocotyle triseriale, N. verrucosum); 1899b, 661, 662, 663, 664; 1901, 192 (taken by Dies. as representative of Notocotyle).—Mol., 1859, 823.—Mont., 1888, 67; 1892, 26, 27, 40 (to Notocotyle); 1892, 685.—Mueh., 1898, 31, 32.—Nord., 1840, 602 (syn. of Nocotylus triserialis), 624 (syn. Fasc. verr. Fr.).—Odhn., 1905, 366, 367, 368, 369, 370 (to Catatropis) (of Looss, 1896, syn. of Notocotyle ægyptiaca Odhn.).—Olfers, 1816, 48.—Rail., 1893a, 340 (to Notocotyle).—Risso, 1826, 262.—Rud., 1809a, 331–333 to (Monost.) (includes Fasc. anseris Gmelin, Festucaria pedata Schrank); 1819a, 84, 344.—Schneidemuehl, 1896, 303.—Sieb., 1835, 56, 60 (in Fulica atra, Gallinula porzana, Phasianus gallus, Rallus aquaticus).—Sons., 1897, 252.—Verrill, 1870, 179.—Wedl, 1857, 248–250, pl. 2, figs. 9–14.—Wolffhuegel, 1900, 9, 55, 56, 57.—Will.-Suhm, 1870, 7.—Reported also for Anas anser, A. bernicla, A. boschas fera, A. marila, A. mollissima, A. querquedula, A. segetum, Cygnus olor, Harelda glacialis, Machetes pugnax, Mergus merganser, Recurvirostra avocetta, Rhynchaspis clypeata.

vespertilionis Rud., 1819a, 87 (t. h. Vespertilio noctula; Cat. Ent. Vien.).—Brand., 1892, 510.—Braun, 1893a, 916.—Dies., 1850a, 329–330 (in Vesp. noc.).—Kolenati, 1857, 11.—Mont., 1892, 712.—Also reported for Vespertilio lasiopterus, Vesperugo noctula.

vinal-edwardsii Lint., 1901, 416, 470, figs. 373, 374, 375, 376; 1905, 329, 335, 379, 410, figs. 220–221 (in Opsanus tau, Orthopristis chrysopterus; Beaufort, North Carolina).

viviparæ Linst., 1877, 185, pl. 13, fig. 16 (in Paludina vivipara).—Mont., 1892, 717

wedlii Cobbold, 1860a, 43 (=M. rhombi lævis Wedl, renamed) (in Rhombus lævis); 1879b, 463.

zederi Rud., 1805a, 44 [evidently not as specific combination, but as Monostoma Zed.].

(MONOSTOMA) Rud., 1809a, typical subg. of Monost. in Rud., 1809a, 328–339 "ore antico, sive terminali." As Rud. excludes Festucaria anatis from M. (Monost.), his typical subg. is to be construed as distinct from Monost. Zed.= Festucaria renamed, by which it is, however, antedated.

attenuatum Rud., 1809a, 328–329 (t. h. Scolopax gallinago, cæca; Griefswald). See also under Monost.

capitellatum Rud., 1819a, 83, 343 (t. h. Sparus salpa; Naples). See also under Monost.

cornu (Zed., 1800) Rud., 1819a, 85. See also under Monost.

crenulatum Rud., 1809a, 328 (t. h. Motacilla phœnicurus, intest.; Greifswald). See also under Monost.

crucibulum Rud., 1819a, 83, 342–343 (t. h. Muræna conger, M. cassini (M. myroides); Naples) (to Gasterost. by Gervais & Ben., 1859) (to Dist. (Crossodera) by Duj. 1845a, 435). See also under Monost.

ellipticum Rud., 1809a, 333 (M. bombynæ Zed., 1800, renamed). See also under Monost.

filicolle Rud., 1819a, 85–86, 347–348 (t. h. Brama raji; Naples). See also under Monost.

foliaceum Rud., 1819a, 83, 340–342 (t. h. Accipenser sturio; Arimini). See also under Monost.

(MONOSTOMA)—Continued.

galeatum Rud., 1819a, 86, 349–350 (t. h. Centronotus glaucus; Naples) (to Gasterost., by Stoss., 1898, 62). See also under Monost.

lineare Rud., 1819a, 83–84, 343–344 (t. h. Tringa vanellus). See also under Monost.

macrostomum Rud., 1809a, 337–338 (t. h. Larus cinerarius, intest.). See also under Monost.

mutabile (Zed., 1800) Rud., 1809a, 333–334. See also under Monost.

ocreatum (Gœze, 1782) Rud., 1809a, 329–331. See also under Monost.

orbiculare Rud., 1819a, 83, 342 (t. h. Sparus salpa; Naples). See also under Monost.

pileatum (Rud., 1802) Rud., 1809a, 338–339 (to Amphist., by Rud., 1819a, 90). See also under Monost.

prismaticum (Zed., 1800) Rud., 1809a, 334–335. See also under Monost.

sulcatum Rud., 1809a, 337 (t. h. Rana pipa). See also under Monost.

tenuicolle Rud., 1819a, 85, 346–347, 577, pl. 2, figs. 1–4 (t. h. Lampris guttatus). See also under Monost.

trigonocephalum Rud., 1809a, 336–337 (t. h. Testudo mydas, stomach; Europe). See also under Monost.

ventricosa (Rud., 1802) Rud., 1809a, 335–336. See also under Monost.

verrucosum (Frœlich, 1789) Rud., 1809a, 331–333. See also under Monost.

MONOSTOMATA Zed., 1800a, 150, plural for Monostoma.—Dowker, 1882a, 11.

MONOSTOMATIDÆ Gamb., 1896a, 73.

MONOSTOMEA Mont.—Olss., 1893.

MONOSTOMEÆ Mont., 1888, 7, 8, 9, 11, 12, 14, 15, 16, 18, 34, 36, 37, 41, 47, 48, 51, 52, 53, 54, 56, 90, 92, 102, 105, 108; 1892, 689.—Brand., 1888a, 49.—Braun, 1893a, 886, 887.—Par. & Perugia, 1890, 9.

MONOSTOMEN, German for Monostomata.—Stiles, 1902, 25, 26.

MONOSTOMES Dechambre, 1875a, 196, French for plural of Monostoma.

MONOSTOMEUS Rafinesque, 1815, 151 (new name for Festucaria Schrank, hence type F. anatis; apparently intended for Monostoma as it is attributed to Zed.

[MONOSTOMIA Rafinesque, 1815, 150, order of Epistomia.]

MONOSTOMIDA Kolenati, 1857, 11.

MONOSTOMIDÆ Cobbold, 1877f, 326; 1879b, 4.—R. Bl., 1895, 729.—Brand., 1890a, 576; 1892, 505.—Braun, 1883a, 58; 1893a, 887, 890, 895, 900, 914; 1895b, 137.—Hoyle, 1890, 539 (includes Monostomum, Monocotyle).—Jackson, 1888, 642, 654 (Monostomum).—Kholodk., 1898, 25, 33.—Looss, 1899b, 541, 543, 658, 659, 752; 1901b, 192, 193; 1902m, 524, 700 (validity of fam. name), 701, 702, 707, 731, 838.—Luehe, 1901, 174; 1901, 488.—Mont., 1888, 7, 10, 18, 21, 52, 60, 66, 67, 93, 105; 1892, Oct. 7, 214 (fam. of suborder Malacocotylea); 1892, 713.—Mueh., 1898, 31.—Pratt, 1902, 890, 909 (includes Microscaphidiinæ, Pronocephalinæ, Haplorchidinæ).—Schneidemuehl, 1896, 295, 296, 303.—Stoss., 1898, 63; 1902, 11.

MONOSTOMIDEA Ben.—Carus, 1863, 479.

MONOSTOMIDEN, German name.—Brand., 1892b, 7 Oct., 504–511.

MONOSTOMIDÉS R. Bl., 1888a, 541, 542, French for Monostomidæ.

MONOSTOMULUM Brand., 1892b, 510 [collective group for immature forms; requires no type].—Stiles, 1902s, 25, 28.

asperum (Vaillant, 1863) Brand., 1892b, 510 [cf. asperum 1857], (in Siren lacertina, sub cute in caps.).

delphini (Blainv., 1825) Brand., 1892b, 510 (in Delphinus dalei, in adipe folliculo inclusum).

dubium (Cobbold, 1858) Brand., 1892b, 511 (in Gasterosteus spinachia, ovarial-peritoneum in caps.).

lentis (Gescheidt, 1833) Brand., 1892b, 510.—Stiles, 1902s, 24–35, pl. 3, figs. 2–5 (in eye of man); 1903u, 223.

lucanicum Brand., 1892b, 511. See also (Glenocerc.) lucanicum.

marænulæ (Rud., 1809) Brand., 1892b, 510 (in Coregonus marænula, ad ventric. in caps.).

præmorsum (Nord., 1832) Brand., 1892b, 511 (in Abramis brama, in regione branchiarum).

MONOSTOMULUM—Continued.

rhombi lævis (Wedl, 1855) Brand., 1892b, 511.

settenii (Naumann, 1840) Brand., 1892b, 511.

viviparæ (Linst., 1877) Brand., 1892b, 511 (in Paludina vivipara).

MONOSTOMUM Crep., 1829, v. 1, 49, for Monostoma Zed., 1800.

MONOSTROMUM Linst., 1904p, 254, misprint for Monostomum.

MONOSTUMUM Mont., 1888, 69, misprint for Monostomum.

MUSALIA Shipley & Hornell, 1904, 93–95 (m. herdmani), pl. 3, fig. 51, pl. 4, figs. 58, 59, 65.

herdmani Shipley & Hornell, 1904, 78, 90, 93–95, pl. 3, fig. 51, pl. 4, figs. 58, 59, 65 (in Margaritifera vulgaris; Ceylon).

MUTTUA Shipley & Hornell, 1904, 90–93 (m. margaritiferæ).

margaritiferæ Shipley & Hornell, 1904, 78, 90–93, pl. 3, figs. 53–57 (in Margaritifera vulgaris; Ceylon).

NEMATHOBOTHRIUM Mont., 1892, Oct. 7, 214 (g. of Didymozoonidæ) (for Nematobothrium).

NEMATOBOTHRIUM Ben., 1858a, 1861a, 11, 107–111, 200, 344, 345 (m. filarina; also by virtual tautonymy).—Braun, 1892a, 567, 569, 574, 577, 665, 696, 698, 699, 700, 707, 711, 727; 1893a, 878, 879, 886, 887, 890, 895, 914, 918; 1895b, 126, 136.—Gamb., 1896, 4, 73.—Hoyle, 1890, 539.—Jackson, 1888, 654.—Maclaren, 1904, 612, 613.—Moniez, 1891, 184–187.—Mont., 1888, 7, 18, 34, 52, 84, 93, 106; 1892, 6; 1892, Oct. 7, 214 (g. of Didymozoonidæ) (Nemathobothrium); 1893, 137.—Pratt, 1902, 890, 909.—Schneidemuehl, 1896, 295.—Tasch., 1879, 607, 614; 1879, 72.

benedeni (Mont., 1893) Maclaren, 1904b, 613, to (Didymozoon).

filarina Ben., 1858a, 1861a, 108–109, pl. 13, figs. 1–12 (t. h. Sciæna aquila) (filarinum in descr. of plates); 1870c, 136–143, pl. 8, figs. 1–9 (embryonic form of); 1870, 32.—Braun, 1892a, 586, 784; 1893a, 914.—Cobbold, 1879b, 462.—Dies., 1859c, 426 (to Monost.).—Gamb., 1896a, 55, fig. 22A.—Jackson, 1888, 654.—Maclaren, 1904b, 602, 603, 606, 612, 613.—Mont., 1888, 9; 1893, 137.

filarinum Ben., 1858, 1861a, descr. of plates, see filarina.

guernei Moniez, 1891, 184–187 (in Thynnus alalonga; Europe).—Braun, 1891d, 423; 1893a, 914.—Maclaren, 1904b, 603, 613.

molæ Maclaren, 1904b, 573, 602–613, pl. 21, figs. 17, 19, 21, pl. 22, figs. 23–33 (in Orthagoriscus mola) (Nemathobothrium); 1904, June 9, 443–444; 1905, Jan. 31, 20–29; 1905, June, 317; 1905, Dec., 703.—Ziegler, 1905, 37.

tænioides (Mont., 1888) Maclaren, 1904b, 613, to (Didymozoon).

NEOPHASIS Staff., 1904, May 3, 485–486 (m. pusilla, νέος=new, φάσις=appearance).

pusilla Staff., 1904, 485–486 (in Anarrhichas lupus; Canada).

(NEPHROCEPHALA) Dies., 1858d, 260–264, subg. of Cerc. (Hormocerc.), renamed, hence type probably echinatoides. [See, however, infra, p. 385.]

echinata (Sieb., 1837) Dies., 1858d, 260–262 (syn. Cerc. (Hormocerc.) echinata Sieb.) (in Paludina vivipara, Planorbis corneus, Lymnæus stagnalis), larva of Dist. echinatum Zed.); 1858e, 344 (to Dist.).

echinatoides (Fil., 1854) Dies., 1858d, 262–263 (syns. Cerc. (Hormocerc.) echinatoides Fil., Cerc. echinifera La Valette, Dist. echiniferum Pag.) (in Paludina achatina, P. vivipara); 1858e, 346 (syn. of Dist. echiniferum La Valette).

megacotyla Dies., 1858d, 263 (syn. Dist. echinatoides Pag. nec Fil.) (in Anodonta cygnea; Heidelberg).

spinifera (La Valette, 1855) Dies., 1858d, 263–264 (in Planorbis corneus; Berlin).

NEPHROCEPHALÆ Dies., 1858d, 260.

NEPHROCEPHALUS Odhn., 1902, 27–29 (m. sessilis), not Nephrocephala,[a] 1858; 1902, 42.—Pratt, 1902, 889, 907.

sessilis Odhn., 1902, 27–29 (in Nilkrokodil).

NEURONAIA Goodsir, (1844) (m. monroi).—Braun, 1889a, 341 (Gasterost.); 1893a, 844.

lampetræ Gulliver [1870, 849–850], 1872, 103, 425 (in Planer's lamprey; Stour River, Canterbury.—Brown, 1899a, 490 (in lamprey).

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[a] In our opinion (Nephrocephala, 1858) does not preoccupy Nephrocephalus, 1902.

NEURONAIA—Continued.

monroi Goodsir, (1844) (in Gadus morrhua).—Brown, 1899a, 490 (munroi).—Gulliver, 1872, 103, 425 (monroii).

monroii Goodsir teste Gulliver, 1872, 103, 425.

munroi Brown, 1899a, 490, for monroi.

NEURONAINA Brown, 1899a, 490 (see Neuronaia).

NITSCHIA Haswell, 1892a, 458 (for Nitzschia).

NITZCHIA Ben., 1858a, 1861a, 11, 38, for Nitzschia.

hippoglossii Ben., 1858a, 1861a, 21.

NITZSCHIA Baer, 1826a, 125 (m. elegans for Hirudo sturionis Abildg, renamed elegans) [not Nitzschia Denny, 1842, insect]; 1827b,675–676, pl. 32, figs. 1–6.—Ben., 1858a, 1861a, 11, 38 (Nitzchia).—Ben. & Hesse, 1864, 64, 65, 66 ,67–68.—Blainv., 1828a, 567–568.—R. Bl., 1888, 130.—R. Brand., 1891d, 9.—Braun, 1890a, 411, 412, 414, 423, 425, 435, 436, 440, 450, 451, 466, 474, 484, 485, 511, 515, 516, 517, 519, 523, 526, 527; 1890e, 597; 1891d, 422; 1893a, 889.—Burm., 1837a, 530; 1856a, 251.—Dies., 1850a, 290, 425–426 (syns. Hirudo Abildg., Trist. Nitzsch); 1858e, 313, 363 (mentions only elegans).—Gamb., 1896, 73.—Goldb., 1855, 19.—Haswell, 1892a, 458 (Nitschia).—Johnston, 1865, 30; 1865, 33.—Massa, 1906, 43, 48.—Mont., 1888, 10, 13, 83, 86, 87, 97; 1891, 100, 105, 107, 126; 1892, Oct. 7, 213 (g. of Tristominæ); 1893, 8, 210; 1899, 98, 99; 1903, 335 (subf. Ancyrocotylinæ; f. Tristomidæ); 1904, 117, 122.—Nord., 1832a, 60.—Pratt, 1900, 646, 648, 658.—Tasch., 1878, 564, 566 (syn. of Trist.); 1879, 233.

[*dubius* see Kellogg, 1876c, 544, arthropod.]

elegans Baer, 1826a, 125–126 (Hirudo sturionis Abildg., renamed); on gills of Stör; 1827b, 660–678, pl. 32, figs. 1–6 (includes Trist. elongata, 1826).—Abildg. (1797), 135, pl. 3, figs. 3–5; 1794b, 55, pl. 6, fig. 1 a. b. c.—Ben. & Hesse, 1864,, 67–68 (syns. Hirudo sturionis; Phylline, Trist. elongatum, T. sturionis).—Blainv., 1828a, 568.—E. Bl., 1847, 323.—Braun, 1889h, 433–434 (syn. of Trist. elongatum Nitzsch); 1889k, 612.—Crep., 1846, 149.—Cuv., —.—Dies., 1850a, 426 (syns. Hirudo sturionis Abildg., Trist. elongatum Nitzsch, Capsala elongata Nord., Trist. sturionis Cuv. (in Accipenser sturio, A. guldenstædtii, A. acutirostris; Scotia); 1858e, 363.—Duj., 1845a, 323 (syn. of Trist. elongatum).—Johnston, 1865, 33–34, 299.—Leidy, 1887, 24.—Linst., 1903, 280.—Lint., 1898c, 508; 1901, 408, 414, 435.—Mont., 1904, 117; 1905, 117.—Moquin-Tandon, 1846a, 394.—Mueh., 1898, 11, 17.—[Nitzsch, 1826, 150–151.]—Nord., 1832a, 66; 1840, 602 (syn. of Capsala elongata).—Oken, ——, 371.—Tasch., 1878, 563, 564, 565, 568 (syn. of Trist. elongatum Nitzsch); 1879, 56.

elongata (Nitzsch, 1826) Johnston, 1865, 34.—Braun, 1890a, 411, 419, 422, 424, 427, 428, 430 (elongatum), 431, 434, 437, 440, 445, 449, 450, 453, 456, 464, 472, 479, 489, 494, 497, 512, 527 (in Acipenser sturio), 547, 550; 1890e, 597, to (Trist.); 1892a, 667.—Gamb., 1896a, 56.—Kath., 1894a, 154.—Lint., 1901, 408, 414, 435 (in Acipenser sturio; Woods Hole, Mass.).—Mont., 1891, 106, pl. 6, fig. 32.—Pratt, 1900, 655, fig. 4; 657, 659.

hippoglossi (Mueller, 1776) Tasch., 1878, 568 (to Trist.) (for hippoglossii).

hippoglossni Ben., 1858a, 1861a, 21 (to Epibdella).—Tasch., 1878, 568 (hippoglossi) (to Trist.).

[*lincaris*, a diatom.]

[*palea*, a diatom.]

papillosa Lint., 1898c, 508–509, pl. 40, figs. 1–6 (in Gadus callarias) [type U. S. N. M. 4874]; 1901, 414, 476 (in Gadus callarias; Woods Hole, Mass.).—Mont., 1904, 117 (to Lintonia); 1905, 70; 1905, 117 (to Lintonia as type).—Pratt, 1900, 659.

[*pulicaria*, a louse on the swift, Chætura pelagica.]

[*sigmoidea*, a diatom.]

sturionis (Abildg., 1794) Kroyer, 1852–53a, 777 (in Acipenser sturio L.).

[*subtilis*, a diatom.]

NOCOTYLUS Nord., 1840, 602 (for Notocotylus).

NOTOCOTYLE Dies., 1850a, 288, 411, for Notocotylus 1839 (m. triseriale) (syns. Fasc. Frœlich, Festucaria Schrank, Monost. Zed., Notocotylus Dies.); 1858e, 314, 369; 1859c, 437–438.—Brand., 1891d, 22; 1892, 506, 508.—Braun, 1890a, 515; 1893a, 887, 890, 891, 893, 895, 914, 916, 918; 1893b, 179, 185; 1893d, 466; 1901b, 51, 52; 1901e, 346.—Cohn, 1904, 230.—Gamb., 1896a, 73.—Goldb.,

NOTOCOTYLE—Continued.

1855, 17.—Hoyle, 1890, 539 (N. triseriale Dies.=Monost. verrucosum).—Jackson, 1888, 642 (cf. Monost. verrucosum).—Looss, 1894a 131, 204; 1896b, 147, 1899b, 661–664, 665, 667; 1901, 192 (cf. Monost. verrucosum); 1902m, 546, 602, 610, 612, 639, 701.—Luehe, 1901, 174.—Mont., 1888, 84, 93, 106; 1892m, 24–46, pl. 1. figs. 1–19; —— 126; 1892, Oct. 7, 182, 183, 214 (gen. of Monostomidæ); 1892; 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 702, 703, 704, 705, 706, 708, 709, 713, 714; 1893, 15, 24, 27, 28, 52, 83, 84, 91, 105, 108, 144, 205; 1896, 151.—Odhn., 1905, 367, 368, 370.—Ofenheim, 1900, 156, 183.—Ssinitzin, 1896, in 1–20, 1 pl. (in birds at Warschau).—Stoss., 1902, 5.—Tasch., 1879, 234.

ægyptiaca Odhn., 1905, 370 (Monost. verrucosum of Looss, 1896, renamed).

alveatum (Mehlis, 1845) Mont., 1892, 39, 41, pl. 1, fig. 8 (in Anas penelope, Fuligula marila, Harelda glacialis, Oidemia fusca, Somateria mollissima).—Braun, 1893a, 916; 1893b, 185.

discrialis Ssinitzin (1896) (in Rallus aquaticus).

proteus (Brand., 1891) Mont., 1892, 703; 1892, 30.

triseriale (Dies., 1839) Dies., 1850a, 411–412 (syns. Fasc. verrucosa Frœlich, F. anseris Gmelin, Festuc. pedata Schrank, Monost. verrucosum Zed., M. marillæ Rud., M. lineare Rud.); 1858e, 369 (in Anas anser dom. et ferus, Hæmatopus ostralegus, Gryphiæ; Fulica atra); 1859c, 437 (syn. Monost. verr.) (in Anas tadorna, Planorbis, Lymnæus; Belgium).—Ben., 1858a, 1861a, 78 (syn. of Monost. verr.).—Brand., 1891d, 22 (triserialis).—Braun, 1892a, 581; 1893a, 916; 1893b, 177.—Hass., 1896a, 3 (syn. of N. verr. (Frœlich)).—Hoyle, 1890, 539 (= Monost. verr.).—Kowal., 1895g, 41 (1).—Landois, 1882, 23 (triserialis).—Looss, 1894a, 204; 1896b, 146 (syn. of Monost. verr.).—Mont., 1892, 26, 40 (syn. of N. verr. Frœlich).—Odhn., 1905, 367 (syn. of Catatropis verrucosa, type of Catat.); 1905, 370.—Rail., 1893a, 340 (= N. verr.).—Also reported for Anas querquedula, Anser albifrons, A. cinereus, A. cinereus dom., A. segetum, Fuligula ferina, Harelda glacialis).

verrocosum Mont., 1892, 40 (for verrucosum).

verrucosum (Frœlich, 1789) Mont., 1892, 28, 29, 30, 39, 40 (verrocosum), 41, pl. 1, figs. 1–7, 9–16 (syns. Monost. verr. Zed., M. attenuatum Rud., M. ovatum Mol., Notocotyle triseriale Dies.) (in Anas bewikii, A. boschas dom., A. boschas fer., A. penelope, A. querquedula, Anser albifrons, A. cinereus ferus, A. cinereus dom., A. leucopsis, A. segetum, Ascolopax gallinago, Cairina moschata, Crex pratensis, Cygnus musicus, Fulica atra, Fuligula cristata, F. ferina, F. marila, Gallinula chloropus, Gallus gallinaceus, Glaucio clangula, Hæmatopus ostralegus, Harelda glacialis, Mergus merganser, M. serrator, Oidemia fusca, Ortygometra porzana, Rallus aquaticus, Rhynchaspis clypeata, Somateria mollissima, Tadorna vulpanser, Vanellus cristatus); 1892, 689, 690, 691, 703, 709; 1893, 24, 51.—Braun, 1893a, 916; 1893b, 185.—Kowal., 1896d, 254 (4) (in Anas boschas, A. crecca, Fuligula marila; Dublany).—Hass., 1896a, 3 (syns. Fasc. verr. (Frœlich), Monost. verr. (Frœlich), M. attenuatum Rud., M. lineare Rud., Notocotylus triserialis Dies., Notocotyle triseriale (Dies.)) (in Gallus dom.).—Looss, 1896b, 146 (syn. of Monost. verr. Frœ.); 1899b, 661, 662, 663, 664, 770; 1902m, 444; (verrucosa: Cerc. imbricata Looss), 807.—Odhn., 1902, 63 (verucosa).—Olss., 1893, 12–13.—Rail., 1893a, 340.—Stoss., 1901, 92 (4) (in Rallus aquaticus; Triest).

verucosa Odhn., 1902, 63 (for verrucosum).

NOTOCOTYLUS Dies., 1839a, 234 (m. triserialis).—Braun, 1893a, 884.—Cobbold, 1877, 237, 238; 1877f, 326; 1879b, 360.—Mont., 1892, 26 (syn. of Notocotyle).—Moul., 1856a, 16.—Nord., 1840, 601–602 (Nocotylus).—Pratt, 1902, 890, 910.

triserialis Dies., 1839a, 234–235 (syns. Fasc. verrucosa Frœlich, F. anseris, Fest. pedata Schrank, Monost. verrucosum Zed.) (in Anas anser dom., A. anser, A. querquedula, A. boschas dom., A. marila, A. penelope, A. albifrons, Cygnus bewikii, Fulica atra, Gallinula porzana, Phasianus gallus, Rallus aquaticus; Europe), pl. 15, figs. 23–25; 1850a, 411, to Notocotyle; 1858e, 369 (in Anas anser dom. et ferus, Hæmatopus ostralegus, Greifswald; Fulica atra).—Ben., 1858a, 1861a, 78 (syn. of Monost. verrucosum).—Crep., 1849a, 68.—Hass., 1896a, 3 (syn. of N. verr. (Frœlich)).—Nord., 1840, 602 (Nocotylus) (syns. Fasc. verr., F. anseris, Monost. verr.).—Odhn., 1905, 366 (syn. of Catatropis verrucosa (Frœlich)).—Rail., 1893a, 340.

OCBOTRYUM Moul., 1856a, 10, misprint for Octobothrium.

OCHETOSOMA Braun, 1901g, 944 (m. monstruosum): 1902b, 64, 65, 67.—Pratt, 1902, 888, 902.

monstruosum Braun, 1901g, 944 (in Corone venustissima: West Indies); 1902b, 65.

OCREATA Gœze, 1782a, 41, 182–183, a "Gattung" of Fasciola Gœze, from a Maulwurf.

OCTANGIINÆ Looss, 1902m, 699.

OCTANGIUM Looss, 1902m, 433, 633, 634, 637, 642, 645, 649, 650, 652, 653, 657, 660, 668, 670, 674, 675, 682, 684–685, 686, 687, 698, 699, 824 (tod. sagitta), family Angiodictyidæ.

hasta Looss, 1902m, 686–687, 690, 697, pl. 29, figs. 128–132, 133b (in Chelone mydas; apparently Egyptian coast).

sagitta (Looss, 1899) Looss, 1902m, 416, 633, 636, 685–686 (syns. Monost. proteus ohne Geschlechtsproducten, of Walter, 1893, 197, pl. 10, figs. 13, 18, 19, etc., Microscaphidium sagitta Looss, 1899), 687, 697, pl. 29, figs. 122–127, 133a, pl. 30, figs. 143, 144.

OCTOBOHTRINÆ Mont., 1903, 336, misprint for Octobothrinæ (f. Octocotylidæ).

OCTOBOTHRIDÆ Mont., 1888a, 86, 88, for Octobothriidæ.

OCTOBOTHRIDEA Tasch.—Olss., 1893, 4, subf. to contain Octobothrium, Diplozoon, Diporpa.

OCTOBOTHRII E. Bl., 1847, 330–331 (for Onchobothriens of Duj., 1845a, 312) (tribe of Trematoda, contains Axine, Diplozoon, Diporpa, Octobothrium, Polyst.).

OCTOBOTHRIIDÆ Tasch., 1879, 235, 236, 238 (syn. Octocotylidæ Ben.); 1879, 68 (syn. Octocotylidæ Ben.).—Braun, 1890a, 516, 517, 533, 538.—Hoyle, 1890, 539 (Octobothrium, Anthocotyle, Phyllocotyle, Platycotyle, Pleurocotyle, Diplozoon, Hexacotyle, Plectanocotyle).—Jackson, 1888, 654 (Octobothrium, Diplozoon).—Mont., 1888a, 86 (Octobothridæ), 88.

OCTOBOTHRINÆ Mont., 1903, 336.

OCTOBOTHRIUM F. S. Leuck., 1827a, 24 (m. lanceolatum); 1828, 18 (nec Dies., 1850a, Cestode) (m. lanceolatum); 1842a, 18, 29 (syns. Mazocraes, Octost.).—Ben., 1856e (Octobothrium du Merlan); 1858a, 1861a, 11, 44–45, 57, 193, 197, 345; 1868, 22.—Ben. & Hesse, 1864, 61, 102.—Braun, 1889k, 620, 621; 1890a, 445, 451, 469, 471, 477, 480, 489, 490, 515, 516, 517, 518, 522, 523, 534; 1891d, 422; 1895a, 1204; 1900a, 1654, 1657, 1671, 1672, 1679, 1684, 1705, 1726.—Burm., 1837a, 530.—Carus, 1863, 477–478.—Cerf., 1895h, 916, 920, 921; 1895m, 139; 1896, 516, 546; 1899a, 391.—Cobbold, 1879b, 35, 41.—Crep., 1838, 84; 1839, 291.—Dies., 1850a, 417 (of Nord., syn. of Dicotylophora), 419 (of Nord., syn. of Cyclocotyle), 421 (syn. of Octocotyle Dies.), 423 (syn. of Discocotyle Dies.), 480, 603 (Dies., n. g., cestode, m. rostellatum); 1863, 284.—Duj., 1845a, 312–313, 314–315, O. (Cyclocotyle).—Gamb., 1896a, 56, 73.—Goto, 1891a, 161, 174, 178, 183, 184; 1891c, 103; 1893a, 798.—Haswell, 1892b, 149; 1893e, 114.—Hoyle, 1890, 539 (of Nord.).—Ijima, 1884c, 638.—Jackson, 1888, 654.—Johnston, 1865a, 30, 31.—Kath., 1894a, 148.—Kroyer, 1843–45a, 166 (in Lota molva Cuv.).—R. Leuck., 1863a, 450, 615.—Looss, 1892, 72, 73.—Mayer, 1841a, 25, 33.—Mont., 1888, 83, 84, 88, 89; 1893, 111; 1903, 336 (syns. Glossocotyle [+Ophicotyle]) (subf. Octobohtrinæ).—Nord., 1832a, 69, 76–77; 1840, 599.—Par. & Perugia, 1896, in 135–138; 1896, 4 pp.; ——, 653.—Pratt, 1900, 646, 652, 656, 660, fig. 33.—St.-Remy, 1898, 523, 544–545.—Schneider, 1866, 334.—Scott, 1901, in 120–153; 1901, 145.—Tasch., 1879, 232, 233, 238, 239, 240, 241, 242, 243; 1879, 248 (of Grube) (syn. of Pleurocotyle Gerv. & Ben.); 1879, 35, 59, 69.

1856: Ocbotryum Moul., 1856a, 10, misprint.

alosæ Leuck., (1828).—Cerf., 1895h, 918, 920, 921, 922; 1895m, 140; 1896, 516, 517, 547.—Duj., 1845a, 313 (syn. of O. lanceolatum) (in Clupea alosa; Rennes).—Mayer, 1841a, 19, pl. 3, figs. 1–8.

alosæ (Ben. & Hesse, 1863) Braun, 1890a, 414, 418, 534, O. (Glossocotyle), 548 (Brest), 550 (in Alosa vulgaris).—Tasch., 1879, 244 (syn. Glossocotyle alosæ) (in Alosa vulgaris).—St.-Remy, 1898, 545.

alosæ (Hermann, 1782) E. Bl., ——.—Ben. & Hesse, 1858a, 1861a, 46 (syn. of O. lanceolatum).—Scott, 1901, 8; 1901, 145, pl. 8, fig. 21 (in Clupea alosa, C. finta); 1905, 118.—Tasch., 1879, 244 (syn. of O. lanceolatum Leuck.).

alosæ of Mayer, 1841a, 19, see lanceolatum alosæ.—Baird, 1853a, 40 (= O. lanceolatum).

OCTOBOTHRIUM—Continued.

arcuatum (Sons., 1890) Braun, 1890a, 534 (=Vallisia striata Par. & Perugia), 551 (in Lichia amia).

bellones (Otto, 1823) Tasch., 1879, 245–246 (syn. Cyclocotyle bellones Otto) (in Bellone acus).—St.-Remy, 1898, 555.

belones (Otto, 1823) Nord., 1840, 600 (for bellones) (syn. Cyclocotyla bellones Otto).—Dies., 1850a, 419 (to Cyclocotyle).

bramæ Par. & Perugia, 1896, 1 (in Brama rayi; Genova).—St.-Remy, 1898, 548 (to Octocotyle).

chrysophryi (Ben. & Hesse, 1863) Braun, 1890a, 418, 535, 548, 550.—Tasch., 1879, 247 (syn. Choricotyle chr. Ben. & Hesse) (in Chrysophrys aurata).

denticulatum Olss., 1876, 10, pl. 1, figs. 13–17 (in Gadus virens).—Braun, 1890a, 418, 499, 514, 534. 548, 550.—Cerf., 1895h, 914, 921 (in Gadus carbonarius; Skagerrack); 1896, 510–511, 516.—Lint., 1900, 269, 283, 286, pl. 33, figs. 6–10; 1901, 408, 414, 474 (in Pollachius virens; Woods Hole, Mass.).—Par., 1899, 4; 1902, 3 (in Gadus minutus; Elba).—St.-Remy, 1898, 549 (to Dactylocotyle.)—Tasch., 1879, 246 (in Gadus virens).

digitatum Rathke, (1843), 242–244, pl. 12, figs. 13–15 (in Hippoglossus gigas; Norway).—Ben., 1858a, 1861a, 50, 51.—Cerf., 1895h, 917 (syn. of O. palmatum); 1896, 513.—Dies., 1850a, 418 (syn. of Diclidophora palmata); 1858e, 384 (syn. of Dicl. pal.); 1859c, 443, to Octoplectanum.—Johnston, 1865, 31.—Tasch., 1879, 246 (syn. of Octob. pal.).

[*dipsacum* Lint., 1897a, 806, a cestode.]

esmarkii Scott, 1901, 147, pl. 8, fig. 22 (in Gadus esmarkii; Shetland); 1905, 118.

fintæ (Ben. & Hesse, 1863) Tasch., 1879, 244 (type of Ophicotyle Ben. & Hesse) (in Alosa finta).—Braun, 1890a, 414, 418, 452, 534, 548, 550.—St.-Remy, 1898, 546.

harengi (Ben. & Hesse, 1863) Tasch., 1879, 244 (in Clupea harengus).—Braun, 1890a, 414, 418, 452, 534, 548, 550.—St.-Remy, 1898, 545.—Scott, 1901, 145–146 (in Clupea harengus); 1905, 118.

heterocotyle (Ben., 1870) Tasch., 1879, 245 (in Clupea sprattus).—St.-Remy, 1898, 555.

hirudinaceum Bartels, 1834, 61 (t. h. Salmo lavaretus; St. Petersburg).—Crep., 1839, 291.—Duj., 1845a, 315 (to Cyclocotyle).—Leuck., 1842, 30.—St.-Remy, 1898, 555.

hirundinaceum Dies., 1850a, 424, for hirudinaceum (to Discocotyle) (in Coregonus wartmanni).

lanceolatum Leuck., 1827a, 24 (in Clupea alosa; Germany); 1828, 18, pl. 1, fig. 7a-b (in Alosa vulgaris); 1842, 29.—Ben., 1858a, 1861a (of Duj.), 45–49, 50, 51, 53, 168, 169, 170, 172, 176, 186, 189, 190, 196, pl. 5, figs. 1–18 (syns. Mazocraes alosæ Hermann, Octob. alosæ Leuck., Octost. alosæ Kuhn, Octocotyle lanceolata Dies.); 1868, 5; 1868, 34, figs. 11–12.—Ben. & Hesse, 1864, 101.—Braun, 1890a, 407, 414, 419, 429, 431, 438, 439, 442, 448, 452, 453, 476, 483, 485, 489, 490, 494, 511, 534, 548, 550; 1891a, 52, 54.—Cobbold, 1872b, 90; 1879b, 41.—Crep., 1838, 84; 1839, 291.—Dies., 1850a, 422 (to Octocotyle); 1859c.—Duj., 1845a, 313, pl. 8, fig. F.—Fraip., 1880a, 400; 1880c, 416, 433; 1883a, xxxvi.—Jackson, 1888, 646, 649.—Kerbert, 1881a, 556.—Kroyer, 1846–53a, 218 (in Alosa finta Cuv.).—Looss, 1894a, 234.—Mont., 1893, 112.—Nord., 1832a, 58, 76, 77 (syns. Octost. alosæ Kuhn, Maz. alosæ Herm.); 1840, 599 (syns. Maz. alosæ Herm., Octost. alosæ Kuhn).—Par., 1896, 1.—St.-Remy, 1898, 545.—Tasch., 1879, 241, 242, 244 (syns. Maz. alosæ Herm., Octost. alosæ Kuhn, Octob. alosæ (Herm.) E. Bl., Octocotyle lanceolata Dies., Octoplectanum lanceolatum Dies.) (in Alosa vulgaris).

lanceolatum alosæ Mayer, 1841a, 19–25, 4 (lanceolatum), pl. 3, figs. 1–9, Hermann's species.

leptogaster Leuck., 1830a, 612 (t. h. Chimæra monstrosa; Europe); 1842a, 22–23, 30, pl. 1, fig. 5, pl. 2, figs. 2a–b.—Braun, 1890a, 418, 514.—Dies., 1850a, 424 (to Discocotyle).—Duj., 1845a, 314–315 to (Cyclocotyle).—St.-Remy, 1898, 546.—Tasch., 1879, 245 (syns. Discocotyle lept. Dies., Placoplectanum lept. Dies.) (in Chim. monst.).—Wagener, 1852, 544.

luscæ (Ben. & Hesse, 1863) Tasch., 1879, 247 (in Morrhua lusca).—Braun, 1890a, 418, 535, 551.

OCTOBOTHRIUM—Continued.

merlangi (Kuhn, 1830) Nord., 1832a, 76, 78–80, 81, pl. 7, figs. 1–5 (in Gadus merlangus), 115, pl. 7, figs. 1–5; 1840, 599.—Ben., 1856a, ——; 1856e, ——; 1857n; 1858a, 1861a, 49–52 (syn. Diclidophora longicollis Dies.) (in Gad. merl.).—Braun, 1889h, 621; 1891a, 52; 1890a, 410, 415, 419, 424, 452, 453, 534, 546, 548, 549, 550, 551; 1893b, 179.—Cerf., 1895h, 915–916 [920], 921 (syns. Octob. platygaster Leuck., Dicl. longic. Dies., Octoplectanum longic. Dies., Octob. squillarum Par. & Perugia) (in Gad. merl.); 1896, 511, 516.—Crep., 1838b, 84; 1839a, 291.—Dies., 1850a, 417 (renamed Diclidophora longicollis); 1858e, 384 (syn. of Dicl. longic. Dies.); 1859c, 443.—Duj., 1845a, 314 to (Cyclocotyle).—Gamb., 1896a, 56, fig. 23.—Scott, 1901, 146–147 (in Gad. merl.); 1901, 343 (in Gad. merl.; Irish Sea); 1905, 118 (Scott, 1895, pl. 4).—Tasch., 1879, 241, 242, 245 (syns. Dicl. longic. Dies., Octoplectanum longic. Dies.) (in Merlangus communis, Cymothoa œstroides).—Reported also for Box salpa, Boops sp., Bopyrus squillarum.

minus Olss., 1876, 10 (in Gadus melanostomus).—Braun, 1890a, 418, 514, 534, 548, 550.—Cerf., 1895h, 922; 1896, 517; 1898a, 302 (in Gad. mel.).—Tasch., 1879, 246 (in Gad. mel.).

morrhuæ (Ben. & Hesse, 1863) Tasch., 1879, 246 (in Gadus morrhua).—Braun, 1890a, 419, 535, 548, 550.

palmatum Leuck., 1830a, 612 (t. h. Gadus molva; Germany); 1842a, 24–28, 30, pl. 1, fig. 4 (in Gad. mol).—Ben. & Hesse, 1864, 107 (to Pterocotyle).—Braun, 1890a, 419, 492, 494, 497, 514, 535, 548, 551.—Cerf., 1895h, 916–917, 921 (syns.: Octodactylus [type] inhærens Dalyell, Octob. digitatum Rathke, Diclidophora pal. Dies., Pterocotyle pal. Ben. & Hesse, Octoplectanum pal. Dies.) (in Gad. mol.); 1896d, 513, 516.—Dies., 1850a, 418 (to Diclidophora).—Duj., 1845a, 314 to (Cyclocotyle).—Johnston, 1865a, 31.—Kroyer, 1838–40a, 608 (in Lota molva L.).—Tasch., 1879, 241, 242, 246 (syns.: O. digitatum Rathke, Dicl. pal. Dies., Octoplectanum pal. Dies., Octodactylus inhærens Dalyell, Pterocotyle pal. Ben. & Hesse) (in Molva vulgaris, Hippoglossus gigas).—Reported also for Gadus merlangus.

phycidis (Par. & Perugia, 1889) Braun, 1890a, 418, 535, 548, 551 (in Phycis blennoides).

pilchardi (Ben. & Hesse, 1863) Tasch., 1879, 244 (in Clupea pilchardus).—Braun, 1890a, 414, 418, 534, 548, 550.—St.-Remy, 1898, 546.

platygaster Leuck., 1842a, 30 (in Gadus merlangus).—Cerf., 1895h, 915 (syn. of O. merlangi); 1896a, 511.—Duj., 1845a, 314 (syn. of O. merlangi).

pollachii (Ben. & Hesse, 1863) Tasch., 1879, 246–247 (in Merlangus pollachius).—Braun, 1890a, 415, 418, 452, 535, 548, 551.—Par. & Perugia, 1891, 18, to (Dactylocotyle).

[*rostellatum* Dies., 1850a, 603 (syns. Tænia erythrini Fabricius, Halysis octolobata Zed., Tænia octolobata Rud.) (in Sebastes norvegicus); 1863, 284 (misprint Onchobothrium rostellatum Dies.).—Braun, 1895a, 1204.—Kroyer, 1852–53a, 595?, 1261.—Luehe, 1899, 542.—Zschokke, 1903, 27, 28.]

sagittatum Leuck., 1842a, 49–57, pl. 2, fig. 5a–k (in Salmo fario).—Braun, 1890a, 518, 534, 548, 551.—Dies., 1850a, 424 (to Discocotyle as type); 1858e, 384 (syn. of Diclidophora palmata); 1859c, 443 (syns. Octoplectanum longicolle, O. palmatum).—Duj., 1845a, 314.—Hofer, 1903e, 38–39, 1 fig. (pernicious anemia).—Pratt, 1900a, 656, 657, 660 (key), fig. 33.—St.-Remy, 1898, 555.—Tasch., 1879, 241, 243–244 (syns. Cyclocotyle lanceolata, Discocotyle sag., Placoplectanum sag.) (in Salmo fario).—Also reported for Coregonus lavaretus, Salmo trutta.

scombri (Kuhn, 1829) Nord., 1832a, 76, 77–78 (in Scomber scomber); 1840, 599.—Ben. & Hesse, 1864, 100 (of Grube to Pleurocotyle).—Braun, 1890a, 410, 418, 452, 514, 534, 548, 552.—Burm., 1837, 530.—Crep., 1838b, 84; 1839a, 291.—Dies., 1850a, 422 (syn. of Octocotyle tunicata); 1858e, 385 (of Grube, renamed Grubea cochlear, type of Grub.).—Duj., 1845a, 313, pl. 8, fig. e.—Grube, 1855a, 137–140, pl. 6, figs. 1–3 (on Scomber scomber), see also Tetracotyle scombri.—Leuck., 1842a, 30.—Scott, 1901a, 344 (in Mackerel; Manx coast); 1901, 146, pl. 8, fig. 20 (in Scomber scombrus); 1905, 118.—Stoss., 1898, 12.—Tasch., 1878, 574, 575, 576 (of Grube, to Pleurocotyle); 1879, 241, 242, 243 (syn. Octocotyle truncata, Octoplectanum trunc., Octocotyle sc.) (in Sc. scombrus, S. colias; Naples), 248 (of Grube) (to Pleurocotyle).

smaris Ijima, in Goto, 1894a, 207, see sub Diclidophora.—Cerf., 1895m, 140; 1896, 547.

OCTOBOTHRIUM—Continued.

species Ijima, 1884c, 637.

species Braun, 1890a, 472.

squillarum (Par. & Perugia, 1889) Cerf., 1895h, 916, syn. of Octob. merlangi (Kuhn); 1896, 512.—St.-Remy, 1898, 555 (syn. of Dactylocotyle merlangi, teste Parona).

taschenbergii (Par. & Perugia, 1898) Braun, 1890a, 535, 548, 552 (in Sargus rondeletii).

thunninæ (Par. & Perugia, 1898) Braun, 1890a, 419, 534, 548, 552 (in Thynnus thunnina).

OCTOBOTHRYUM Fraip., 1883a, 36, for Octobothrium.

OCTOCOLYTE Mont., 1888a, 57 (for Octocotyle).

OCTOCOTYLE Dies., 1850a, 289, 421–422 (includes lanceolata [type by inclusion] and truncata); 1858e, 382–393, renamed Octoplectanum, (syns. Mazocraes, Octobothrium, Octostoma).—Ben. & Hesse, 1864, 96, 97.—Braun, 1890a, 477, 516, 517, 518, 522, 546; 1893a, 890.—Burm., 1856a, 251.—Cerf., 1895h, 918, 920; 1895m, 139; 1896, 514, 515, 516, 547; 1899a, 391.—Cunningham, 1897a, 279.—Goldb., 1855a, 19.—Goto, 1893a, 798; 1894a, 201.—Mont., 1888a, 7, 8, 11, 59, 66, 86, 89, 99; 1892, Oct. 7, 213 (g. of Octocotylinæ) (contains as subg.: Vallisia, Anthocotyle, Diplozoon, Hexacotyle, Phyllocotyle, Plectanocotyle, Platycotyle, Pleurocotyle); 1903, 336 (subf. Octocotylinæ).—Pratt, 1900, 646, 652 (key), 656, fig. 34.—St.-Remy, 1898, 523, 545, 546.—Stoss., 1898, 12.—Tasch., 1879, 239, 241, 242.—See Mazocraes 1782.

1858: Octoplectanum Dies., 1858e, 382 (Octocotyle renamed, hence same type).

1888a: Octocolyte Mont., 1888a, 57, misprint.

1894: Octocotyte: Par., 1894, 594, misprint.

appendiculata (Kuhn, 1829) Sons., 1890, 176.

arcuata Sons., 1890, 112–113 (on Lichia amia; [Mus. Pisa]); 1890, 137–139 (syn. of striata Par. & Perugia).—Par. & Par., 1891, 17.

bramæ (Par. & Perugia, 1896) St.-Remy, 1898, 547–548 (in Brama rayi).

emarginata (Olss., 1876) Sons., 1890, 176.

harengi Ben. & Hesse, 1863, 1864, 98–99, pl. 9, figs. 1–10 (in Clupea harengus).—Braun, 1890a, 498.—Mont., 1888a, 13.—Tasch., 1879, 244 (to Octobothrium).

lanceolata (Leuck., 1828) Dies., 1850a, 422 (includes Mazocraes alosæ Hermann, Octobothrium lanceolatum Leuck., Octostoma alosæ), in Alosa vulgaris; 1858e, 383 (to Octoplectanum); 1859c, 442 (to Octoplectanum).—Baird, 1853a, 40.—Ben., 1858a, 1861a, 44, 46 (to Octobothrium).—Cerf., 1895m, 139; 1896, 547.—Hausmann, 1897b, 4, 7, 20, 23 (in Alosa vulgaris).—Mont., 1888a, 13, 34; 1888, 26 (lanceolatus); 1893, 111.—Tasch., 1879, 244 (to Octobothrium).

lanceolatus Mont., 1888a, 26, for lanceolata.

leptogaster (Leuck., 1830, 1842) Par. & Perugia, 1890, 6, to (Octobothrium); 1892, 2–5 (87–90), pl. 3, figs. 7–8.—Par., 1894, 135 (in Chimæra monstrosa; Nizza).—Wagener, 1852, 544.

major Goto, 1894a, 203–205, pl. 9, figs. 1–6 (on gills of Scomber colias; Misaki); 1899, 274, 275, 276.—Cerf., 1895m, 140 (in Sc. col.); 1896, 547.—St.-Remy, 1898, 546–547.

majus St.-Remy, 1898, 547, misprint for major.

merlangi (Kuhn, 1829) Mont., 1888a, 11, 26; 1890, 420; 1893, 111.—Par., 1894, no. 727; 1894, no. 1060.

minor Goto, 1894a, 205–206; pl. 9, figs. 7–13 (on gills of Scomber colias; Japan); 1899, 274, 275, 276.—Cerf., 1895m, 140 (in Sc. col.); 1896, 547.—St.-Remy, 1898, 547.

pilchardei Mont., 1888a, 66, misprint for pilchardi.

pilchardi Ben. & Hesse, 1863, 1864a, 99, pl. 9, figs. 29–35 (on Clupea pilchardus).—Braun, 1890a, 498.—Mont., 1888a, 13, 66 (pilchardei).—Tasch., 1879, 244 (to Octobothrium).

scombri (Kuhn, 1829) Ben. & Hesse, 1864a, 97–98 (on maquereau).—Cerf., 1895m, 140 (in Scomber scombrus); 1896, 547.—Goto, 1899a, 274–276.—Kroyer, 1838–40a, 595 (in Sc. sc.).—Mont., 1890, 421.—Par. & Perugia, 1889, 742, fig. 3 (in Sc. sc.; Genova); 1890, 742, fig. 3; 1890, 6.—Par., 1894, 503.—Pratt, 1900, 656, 657, 660, fig. 34.—St.-Remy, 1898, 546.—Staff., 1904, 482 (in Sc. sc., Canada).—Stoss., 1892, 66; 1898, 12.—Tasch., 1879, 243 (to Octobothrium).—*Also reported for Sc. colias.*

OCTOCOTYLE—Continued.

species Mont., 1888a, 57, 58.

striata (Par. & Perugia, 1890) Sons., 1890, 137–139 (syn. O. arcuata Sons.) (in Seriola dumerilii, Pisa; Lichia amia, Pisa and Triest); 1891, 9. März, 87–88, to (Vallisia).

thunninæ Par. & Perugia, 1889, 742–743, fig. 4 (in Thynnus thunnina; Genova); 1890, 742–743, fig. 4 (in Th. thunnina; Genova); 1890, 6.—Par., 1894, 594 (Octocotyle).—St.-Remy, 1898, 557.

thynni Par. & Perugia, 1891, 19 [lapsus for thunninæ?].

truncata Dies., 1850a, 422 (Octostoma scombri, Kuhn, 1829, renamed) (t. h. Scomber scombrus; Rhedoni); 1858e, 383 (to Octoplectanum).—Cerf., 1895m, 139, [140]; 1896, 547.—Stoss., 1898, 12.—Tasch., 1879, 243 (to Octobothrium).

OCTOCOTYLIDÆ Ben. & Hesse, ——.—Braun, 1890a, 511, 516, 517, 519, 523, 533, 546.—Cerf., 1895e, 523; 1896d, 497–560, pls. 22–25; 1896, 509, 1899a, 345; 365, 452.—Mont., 1888a, 8, 11, 13, 18, 20, 34, 66, 84 (Octocotylides), 88, 89, 90, 99, 108; 1903, 336 (subf. Onchocotylinæ) (g. Squaloncocotyle, Onchocotyle [=Acanthoncocotyle], Rajonchocotyle); Octocotylinæ (g. Octocotyle, Dactycotyle [=Pterocotyle]); Octobohtrinæ (g. Octobothrium [=Glossocotyle [+Ophicotyle]], Diplozoon, Vallisia); Diclidophorinæ (g. Diclidophora [=Choricotyle], Cyclobothrium, Heterobothrium); Plagiopeltinæ (g. Hexacotyle [=Plagiopeltis]); Diaphorocotylinæ (g. Erpocotyle, Anthocotyle); 1905, 77.—Par. & Perugia, 1890, 6 (=Polystomeæ Tasch.).—Scott, 1901, 141.—Sons., 1890, 138.—Tasch., 1879, 68 (syn. of Octobothriidæ); 1879, 235 (Octocotylides); 1879, 236 (syn. of Octobothriidæ).

OCTOCOTYLIDES Cerf., 1900, 436–438.

OCTOCOTYLINÆ Braun, 1893a, 890.—Gamb., 1896, 73.—Mont., 1892, Oct. 7, 213 (subf. of Polystomidæ); 1903, Dec., 336 (f. Octocotylidæ).—Pratt, 1900, 651 (includes: Octocotyle, Octobothrium, Dactylocotyle, Diclidophora, Anthocotyle, Vallisia, Diplozoön, Phyllocotyle, Hexacotyle, Plectanocotyle, Platycotyle, Pleurocotyle).—St.-Remy, 1898, 523, 544.—Scott, T., 1901, 141.

OCTOCOTYTE Par., 1894, 594, misprint for Octocotyle.

thunninæ (Par. & Perugia, 1889) Par., 1894, 594.

OCTODACTYLUS Dalyell, 1853a, 262 (m. inhærens).—Braun, 1890a, 518.—Goto, 1893a, 798.—Tasch., 1879, 239.

inhærens Dalyell, 1853a, 262–263, pl. 36, figs. 1–2 (on the ling).—Ben. & Hesse, 1864a, 107 (syn. of Pterocotyle palmata Ben. & Hesse).—Braun, 1889a, 348 (is Octobothrium).—Cerf., 1895h, 917 (syn. of Octobothrium pal.); 1896, 513.—Johnston, 1865a, 31.—Tasch., 1879, 246 (syn. of Octob. pal. Leuck.).—Reported for Gadus morrhua.

OCTOPLECTANUM Dies., 1858e, 315, 382–383 (Octocotyle, 1850, renamed, hence lanceolata=alosæ (Mazocraes), type by renaming and inclusion); 1859, 442.—Braun, 1890a, 518.—Tasch., 1879, 239.—See Mazocraes.

affine Lint., 1898c, 511–512, pl. 40, figs. 10–13, pl. 41, figs. 1–5 (in Paralichthys dentatus; Woods Hole, Mass.).

harengi (Ben. & Hesse, 1863) Linst., 1889, 95, in Clupea harengus.

heterocotyle (Ben., 1870) Linst., 1885, 252–253, pl. 15, fig. 30; 1889, 96, in Clupea sprattus Bl.

lanceolatum (Leuck., 1828) Dies., 1858e, 383 (in Alausa vulgaris); 1859, 442–443 (includes Mazocraes alosæ Hermann, Octobothrium lanc., Octost. alosæ Kuhn, Octocotyle lanc.,).—Tasch., 1879, 244 (to Octobothrium).—Type by renaming and inclusion.

longicolle (Dies., 1850) Dies., 1859c, 443.—Cerf., 1895h, 915 (syn. of Octobothrium merlangi); 1896, 512.—Tasch., 1879, 245 (syn. of Octob. merl. (Kuhn)).—Reported for Merlangus pollachius, M. vulgaris, Morrhua barbata.

palmatum (Leuck., 1830) Dies., 1859c, 443.—Cerf., 1895h, 917 (to Octobothrium); 1896, 513.—Tasch., 1879, 246 (to Octob.).—Reported for Hippoglossus gigas, Lota molva.

pilchardi (Ben. & Hesse, 1863) Linst., 1889, 95 (in Clupea pilchardus).

truncatum (Dies., 1850) Dies., 1858e, 383 (in Scomber scombrus; Rhedoni); 1859c, 443–444.—Stoss., 1898, 12.—Tasch., 1879, 243 (syn. of Octobothrium scombri (Kuhn)).

OCTOSTOMA Otto, 1823, 302, as syn. of Cyclocotyla [not Octostoma syn. of Polyst.].

OCTOSTOMA Kuhn, 1829b, 358–363 (alosæ=lanceolata=alosæ (Mazocraes), type by inclusion, also type by first species rule).—Braun, 1890a, 518.—Cerf., 1899a, 349.—Mayer, 1841a, 20.—Tasch., 1879, 239.

alosæ Kuhn, 1829b, 358–361 (in Clupea alosa), pl. 17, figs. 1–3.—Ben., 1858a, 1861a, 44, 46 (syn. of Octobothrium lanceolatum).—Cerf., 1899a, 348, 349.—Duj., 1845a, 313 (=Octob. lanc.).—Nord., 1832a, 76, 77, 82 (syn. of Octob. lanc.).—Tasch., 1879, 241, 244 (syn. of Octob. lanc.).

heterocotyle Ben., 1870, 67 (in Clupea sprattus).—Tasch., 1879, 245 (to Octobothrium).

merlangi Kuhn, (1829b) (t. h. Merlangus communis).—Ben., 1858a, 1861a, 44, 49, 168, 169, 172, 196 (to Octobothrium).—Cerf., 1895h, 915 (to Octob.); 1896, 511; 1899a, 349.—Crep., 1839a, 291.—Duj., 1845a, 314 (to Octob.).—Nord., 1832a, 78–80, 82 (to Octob.) (in Gadus merlangus); 1840, 599 (to Octob.).—Scott, 1901, 343 (to Octob.).—Tasch., 1879, 245 (to Octob.).

scombri Kuhn, 1829b, 361–362, pl. 17, figs. 4–5 (t. h. Scomber scomber).—Cerf., 1899a, 348, 349.—Duj., 1845a, 313 (to Octob.).—Nord., 1832a, 77–78 (to Octob.); 1840, 599 (to Octob.).—Scott, 1901, 344 (to Octob.).—Stoss., 1898, 12 (in Sc. scombrus; Triest).—Tasch., 1879, 243 (to Octob.).

OGMOGASTER Jægers., 1891, 131 (m. plicatus); 1891b; 1892a.—Brand., 1892, 506.—Braun, 1892a, 605, 609, 641, 664, 671, 676, 677, 683, 684, 685, 699,704, 708, 709, 711, 715, 717, 718, 721, 725, 726, 729, 737; 1893a, 887, 890, 893, 895, 914, 916, 918; 1893b, 179.—Gamb., 1896a, 73.—Lander, 1904a, 5.—Looss, 1899b, 664–665; 1902m, 610.—Mont., 1892, Oct. 7, 214 (g. of Monostomidæ); 1893, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 701, 702, 703, 704, 705, 713; 1893, 28, 83, 144, 203, 205.—Ofenheim, 1900, 156.—Pratt, 1902, 890, 910 (key).—Rossbach, 1906, 374.

plicatus (Crep., 1827) Jægers., 1891, 129, 132, 134; 1891b, 32 pp., figs. 1–6; 1892a, 572–573.—Bettend., 1897, 319; 1897a, 15.—Braun, 1892a, 575, 600, 603, 607, 608, 609, 638, 640, 641, 647, 682, 688, 712, 717, 718, 719, 724, 731, 733, 765; 1893a, 917 (in Balænoptera musculus, B. borealis); 1893b, 177 (plicata), 186; 1901e, 344.—Darr, 1902, 657.—Looss, 1899b, 665.—Mont., 1892, 685, 689; 1893, 203.—Odhn., 1905, 366 (Monost. plicatum).

OISTOSOMUM Odhn., 1902, 26–27 (m. caduceus); 1902, 42.—Pratt, 1902, 888, 899.

caduceus Odhn., 1902, 26–27 (in Krokodil; Sudan).

OLIGOCOTYLIDÆ Par. & Perugia, 1890, subf.—Braun, 1890a, 546.—Cerf., 1899a, 365, 452.

OLYOCOTYLEA Mont., 1903, 335–336 ("Sezione" contains: Tristomidæ Ben., 1858, Monocotylidæ Tasch., 1879).

OMPHALOMETRA Looss, 1899b, 562 (m. flexuosa) (ὁ ὀμφαλικός=Nabel or Mitte; ἡ μήτρα=uterus); 1902m, 839.—Braun, 1901b, 33.—Pratt, 1902, 887, 896.—Stoss., 1901, 93 (5).

flexuosa (Rud., 1809) Looss, 1899b, 562.—Stoss., 1901, 93 (5).

OMPHALOMETRINÆ Looss, 1899b, 543, 562; 1902m, 839.—Luche, 1900, 490.—Pratt, 1902, 887, 896 (includes: Omphalometra, Cathæmasia).—Stoss., 1901, 93 (5).

ONCHOCOTILINÆ Cerf., 1899a, 396 (for Onchocotylinæ).

ONCHOCOTYLE Dies., 1850a, 289, 419 (m. appendiculata); 1858e, 314, 370–371; 1859c, 438.—Ben., 1853b, 59–68, figs. 1–11; 1858a, 1861a, 11, 54, 345.—Ben. & Hesse, 1864, 84.—Brand., 1891d, 21; 1894a, 308.—Braun, 1890a, 413, 415, 434, 437, 438, 444, 451, 471, 473, 474, 475, 484, 490, 491, 511, 515, 516, 517, 523, 538, 539, 546; 1893a, 890.—Carus, 1863, 478.—Cerf., 1899a, 345, 346, 347, 351, 359, 365, 368, 369, 371, 402, 411, 434, 452.—Chatin, 1880f, 591; 1881a, 311.—Gamb., 1896a, 73.—Goldb., 1855a, 19.—Goto, 1893a, 798, 800; 1894a, 222–224.—Haswell, 1887a, 286.—Hoyle, 1890, 539.—Jackson, 1888, 647, 654.—Kerbert, 1881a, 544, 554, 572.—Looss, 1894a, 203.—Mont., 1888a, 11, 16, 34, 36, 38, 43, 52, 53, 56, 57, 58, 59, 60, 65, 66, 67, 84, 86, 100; 1892, 35, 36; 1892, Oct. 7, 213 (g. of Polystominæ); 1893, 118; 1903, 336 (syn. Acanthoncocotyle) (subf. Onchocotylinæ).—Pratt, 1900, 646, 651, 656, fig. 26.—St.-Remy, 1890, Nov. 1, 41–43; 1898, 558.—Scott, T., 1901, 151.—Sons., 1890, 176–177.—Stoss., 1898, 11.—Tasch., 1878, 176; 1879, 36, 44, 45, 47, 50, 51, 53, 55, 60, 62, 64, 65, 66, 69; 1879, 252, 255 (syns.: Polyst. Kuhn, Hexabothrium Nord.).—Ziegler, 1883, 556.

1899: Acanthoncotyle Cerf., 1899a, 347 (appendiculata).

ONCHOCOTYLE—Continued.

abbreviata Olss., 1876, 12, pl. 2, figs. 27–28 (in Acanthias vulgaris).—**Braun, 1890a,** 418, 499, 539, 548, 550.—Cerf., 1899a, 361, 368, 369, 375 (to Squalonchocotyle).—St.-Remy, 1890, 42, 43 (in Ac. vulg.).—Sons., 1890, 177.—**Staff., 1904,** May 3, 482 (on Squalus acanthias; Canada).—Tasch., 1879, 253 (in Ac. vulg.); 1879, 29 (in Ac. vulg.).

appendiculata (Kuhn, 1830) Dies., 1850a, 419 (includes Hexabothrium); **1858e,** 370–371 (in Mustelus lævis, M. vulgaris, Scyllium catulus), 371 (**pars,** from Læmargus borealis, syn. of O. borealis); 1859c, 438 (of Ben., 1858a, in Must. vulg., Galeus canis).—Ben., 1858a, 1861a, 54–58, 59, 168–169, 172, 177, 197, pl. 6, figs. 1–12 (in Mustelus vulg., N. Sea and Adriatic; Galeus canis; Scillium catulus, Mediterranean; Læmargus borealis, Greenland); 1870, 5, 6, 16.—Brand., 1891d, 20.—Braun, 1889k, 622; 1890a, 408, 410, 414, 415, 419, 420, 421, 428, 429, 434, 437, 438, 442, 449, 453, 454, 457, 462, 465, 481, 489, 498, 499, 500, 512, 514, 539, 548, 550, 551, 552; 1890e, 594; 1893b, 178.—Cerf., 1899a, 350, 351, 357, 358, 359, 360, 361, 362, 364, 366, 367, 368, 369, 371, 374, 378 (in Lemargus borealis, Scyllium catulus), 374 (of Stoss., 1887, syn. of Acanthonchocotyle canicula), 376 (of Tasch., 1879, syn. of Squalonchocotyle grisea), 376 (of Olss., 1867 and 1876, syn. of Rajonchocotyle batis), 376 (of Sons., 1890, syn. of Rajonch. prenanti).—Cobbold, 1879b, 464.—Fraip., 1880c, 416.—Goto, 1891a, 162.—Ijima, 1884c, 638.—Jackson, 1888, 647.—Juel, 1889, 36.—Kerbert, 1881a, 533.—Kroyer, 1852–53a, 926 (in Scymnus microcephalus).—Looss, 1885b, 5, 10.—Mont., 1888a, 8, 15, 23, 26, 37, 42; 1890, 421.—Par. & Perugia, 1890, 7.—Scott, 1901, 151, pl. 8, figs. 30, 31 (in Galeorhinus galeus, Mustela vulgaris, Raja batis, R. clavata, Scylliorhynus catulus); 1901, 344 (in Raja batis; Irish Sea); 1905, 118 (see Scott, 1901, pl. 8).—Sons., 1890, 176, 177 (see also Octocotyle app.); 1891, 259–260 (syn. O. emarginata Olss.).—St.-Remy, 1890, 42, 43 (in Scyllium catulus, Mustelus vulg., M. lævis, Galeus canis, Raja batis, Hexanchus griseus, Ac. vulg.).—Stoss., 1885, 162; 1898, 11.—Tasch., 1878, 176; 1878, 566, 574; 1879, 253 (syn. Hexathyridium app. Nord.) (in Scyllium catulus, Mustelus lævis, M. vulgaris, Hexanchus griseus, Raja batis, Galeus canis); 1879, 19–20; 1879, 24–47, pl. 3, figs. 1–3, pl. 4, figs. 1, 3–6 (syns. Hexabothrium app. Kuhn, Polyst. app. Nord.).—**Ziegler,** 1883, 345, 557.

borcalis Sons., 1890, 177, misprint for borealis.

borealis Ben., 1853l, 59–68, figs. 1–11 (in Scimnus glacialis); **1858a, 1861a, 58–59** (in Sc. gl.); 1870, 12.—Braun, 1890a, 408, 419, 461, 539, 548.—Cerf., 1899a, 346, 356–358, 359, 360, 361, 362, 364, 367, 368, 369, 372, 378 (in Scymnus glacialis), 374 (to Squalonchocotyle in Scymnus borealis), 376 (of Stoss., 1885, syn. of Rajonchocotyle prenanti).—Dies., 1858e, 371 (in Læmargus borealis) (syns.: O. appendiculatum Dies., Polyst. borealis Wag.); 1859c, 438.—Linst., 1889, 101 (in Læmargus borealis).—Odhn., 1905, 372 (to Squalonchocotyle).—Par., 1894, No. 1050.—Par. & Perugia, 1890, 7.—St.-Remy, 1890, 42, 43 (in Scymnus borealis).—Sons., 1890, 177 (borcalis).—Stoss., 1885, 162; 1890, 52; 1898, 12.—Tasch., 1879, 253 (in Scy. bor.); **1879, 29, 32** (in Scy. bor.)—Also reported for Læviraja oxyrhynchus.

canis (Cerf., 1899) Pratt, 1900a, 656, 657, fig. 26.

emarginata Olss., 1876, 11–12, pl. 2, figs. 23–26 (in Raja clavata).—**Braun, 1890a,** 419, 494, 499, 539, 548, 551.—Cerf., 1899a, 361, 366, 367, 368, 369, 375, 378.—St.-Remy, 1890, 42, 43 (in R. clav.).—Sons., 1890, 176, 177 (see also Octocotyle emarginata); 1891, 259, 260 (syn. of O. appendiculata Kuhn).—Tasch., 1879, 253 (in R. clav.); 1879, 29 (in R. clav.).

prenanti St.-Remy, 1890, 41–43 (in Raja oxyrhynchus; Roscoff).—Cerf., 1899a, 365, 368, 376 (to Rajonchocotyle) (in R. oxyr.).—Goto, 1894a, 223.—Sons., 1890, 177 (in R. oxyr.).

scymni ainosi Dies., 1858e, 371 based on Wagener, 1857, 72 (in Scymnus ainosi).—Cerf., 1899a, 360, 362, 377.—Linst., 1878a, 282.—St.-Remy, 1890, 41.

spinacis Goto, 1894a, 224–226, pls. 15–16, gills of Spinax sp.; at Odawara, Japan.—Cerf., 1899a, 370, 372, 376, 435 (to Squalonchocotyle).—St.-Remy, 1898, 558.

ONCHOCOTYLINÆ Cerf., 1899a, 345–478, pls. 18–21, 396 (Onchocotilinæ); **1900a,** 436–438.—Mont., 1903, 336 (f. Onchocotylidæ).

ONCHOGASTER Claparède, 1863a, 13 (m. natator).

natator Claparède, 1863a, 13, pl. 5, figs. 1–4.—Braun, 1889a, 363, after Leuck., 1863, 95, is perhaps a free swimming polystome larva.

OPHICOTYLE Ben. & Hesse, 1863; 1864, 96, 101 (m. fintæ).—Braun, 1890a, 414, 477, 516, 517, 522, 546.—Cerf., 1895h, 918; 1896, 514.—Mont., 1888a, 8, 11, 86 (Ophycotyle), 89, 99 (Ophycotyle).—Tasch., 1879, 240.

1888: Ophycotyle Mont., 1888a, 8, 11, 86, 89, 99 for Ophicotyle.

alosæ Mont., 1888a, 13 (Ophycotyle).

fintæ Ben. & Hesse, 1863; 1864, 101–102, pl. 9, figs. 19–28 (in Alosa finta).—Braun, 1890a, 446.—Tasch., 1879, 244 (to Octobothrium).

OPHTHALMOPHAGUS Stoss., 1902, 8, 28–29 (m. singularis), subf. Cyclocœlinæ.

singularis Stoss., 1902, 29, pl. 7, fig. 27 (in Gallinula pusilla; loc. not given).

OPHYCOTYLE Mont., 1888a, 8, 11, 86, 99, for Ophicotyle.

alosæ Mont., 1888a, 13.

OPISCORCUS Woolley, 1906, Oct. 6, 1090 (misprint for Opisthorchis).

OPISTHIOGLYPHE Looss, 1899b, 588–589, 592 (tod. endoloba) (ὀπίσθιος=hindermost; ἡ γλυφή=das Eingegrabene).—Pratt, 1902, 888, 896, 898.

endobala Ssinitzin, 1906, 685, for endoloba.

endobola Ssinitzin, 1905, 121–136; 1906, 686, 687, for endoloba.

endoloba (Duj., 1845) Looss, 1899b, 589.—Braun, 1906, 137, figs. 72–73 (in frog).—Kowal., 1902d, 27 (9).—Ssinitzin, 1905, 121–136; 1906, 685 (endobala), 686, 687 (endobola) (Cerc. gibba is larva) (in Rana esculenta, R. temporaria; Warschau).—Staff., 1905, 686–687 (Duj. of Staff., 1900, 403, renamed Glypthelmins quieta).—Stoss., 1901, 96 (8) (in Rana esculenta; Triest).—Ward, 1903, 862.

siredonis (Poir., 1886) Looss, 1899b, 589.

OPISTHODISCUS Cohn, 1904, 240 (m. diplodiscoides), 242, 243.

diplodiscoides Cohn, 1904, 240–243, figs. 6–8 (in Rana esculenta; Coll. Creplin).

OPISTHOGONIMUS Luehe, 1900aa, 555–558, 562 (m. lecithonotus=philodryadum).—Looss, 1901b, 206; 1902m, 839.—Odhn., 1902, 41.—Pratt, 1902, 888 (related to Haplometrinæ), 901.

lecithonotus Luehe, 1900aa, 555–558 (in Coluber sp., Coluber eririo, Philodryas schotti; Brazil); 1900ee, 743 (=O. philodryadum (West)).

philodryadum (West, 1895) Luehe, 1900ee, 743 (in Philodryas schottii; Brazil).

OPISTHORCHIASIS.—A term proposed by Looss, 1905, 88, to designate infection with Opisthorchis.—Aoyama, 1891a.—Askanazy, 1904, 698 (in man, etiology and pathology); 1904, Nov., 229–230.—Huber, 1896, 578.—Katsurada, 1900, 495, 500–503 (in man).—Macgregor, 1877, 3–16.—See also distomatosis, hepatic, Japan.

[*O. felineus*; Askanazy, 1904, (19); 1905, Jan. 10, 790.]

OPISTHORCHIC Stiles, 1901h, 1539 (misprint for Opisthorchis Bl. 1895).

OPISTHORCHIDÆ Luehe, 1901, 486, for Opisthorchiidæ.

OPISTHORCHIIDÆ Braun, 1901b, 34.—Jægers., 1903a, 15 (Opistorchidæ).—Looss, 1902m, 839, 840 (contains Echinostominæ, Omphalometrinæ, Opisthorchiinæ, Rhopaliadinæ; Azygia; Allocreadium; Rhytidodes; Calycodes).—Luehe, 1901, 486.

OPISTHORCHIINÆ Looss, 1899b, 543, 563, 564, 565, 566; 1902m, 718, 839.—Braun, 1901b, 20.—Luehe, 1900, 490.—Pratt, 1902, 888, 895 (includes Opisthorchis, Holometra, Metorchis; related genus, Podocotyle).—Ward, 1903, 863.

OPISTHORCHIS R. Bl., 1895f, 217 (tod. felineus); 1896b, 730.—Braun, 1900g, 250; 1901b, 20; 1901, 564; 1901e, 314; 1902b, 5, 6, 7 (re Campula, Stiles & Hass. have stated that Campula was erroneously made syn. of Opisthorchis); 1903, 3 ed., 157 (erroneously dated 1845); 1906, 163.—Heymann, 1905, 98.—Jacoby, 1900, 7, 9, 16.—Kamensky, 1900a, 3, 4, 5, 13, 19.—Kowal., 1898g, 74; 1898h, 131, 136, 140, 142–148 (28, 33, 37, 39–45); 1898, 121–148.—Looss, 1899b, 539, 549, 551, 559, 560, 563, 564, 565, 590; 1901, 194, 199, 200, 209; 1902m, 529, 712 (Opistorchis), 775–778, 781, 790 (amphitypic), 795, 805; 1905, ——.—Luehe, 1899, 529, 532, 533; 1901, 474.—Mont., 1896, 168.—Odhn., 1902, 37 (Opistorchis).—Ofenheim, 1900, 166.—Pratt, 1902, 888, 895.—Rail., 1896, 160; 1900, 212.—Stiles, 1901, 203, 204, 205.—Stiles & Hass., 1898a, 85, 91 (Opistorchis erroneously as syn. of Campula Cobb.) (type Dist. felineum).—Stoss., 1902, 580.—Ward, 1901, 180; 1903, 869.

1896: Prosthometra Looss, 1896b, 58–60 (felineus).

OPISTHORCHIS—Continued.

1896: Opistorchis Rail., 1896, Mar. 15, 160, misprint.

1901: Opisthorchic Stiles, 1901h, 1539, misprint.

1906: Opiscorcus Woolley, 1906, 1090, misprint.

albidus (Braun, 1893) Rail., 1896, 160.—Rail. & Marotel, 1898, 38 (compared with other forms).—Bossuat, 1902, v. 6 (2), 192.—Jacoby, 1900, 8 (situs inversus 16 times in 68 specimens, 23 per cent).—Kowal., 1898h, 131, 143, 147 (28, 40, 44) (in Felis catus dom.).—Luehe, 1899, 530.—Type of Metorchis 1899.

amphileuca (Looss, 1896) Kowal., 1898, 148 (45) (in Naja haje).

buski (Bl., 1888) R. Bl., 1895, 737 (syns.: Dist. buski Lankester, D. crassum Busk nec Sieb., D. rathouisi Poir.); 1895, 217; 1900, 488.—Galli-Valerio, 1898a, 146.—Manson, 1903e, 664, fig. 107.—Type of Fasciolopsis 1899.

campula (Cobbold, 1876) Looss, 1899b, 559.

choledoca (Linst., 1883) Kowal., 1898h, 148 (45) (in Anas sp.).—Kamensky, 1900a, 5.

compascua Kowal., 1898, 72; 1898h, 133, 134 [30, 31], see xanthosoma compascua.

complexus (Stiles & Hass., 1894) Stiles & Hass., 1896, 155, or Rail., 1896, 160.—Galli-Valerio, 1898d, 146.—Kowal., 1898h, 143, 147 (40, 44) (in Felis catus dom.).

conjunctus (Cobbold, 1860) R. Bl., 1895, 217; 1895, 735; 1900, 488.—Bossuat, 1902, v. 6 (2), 191–192.—Braun, 1883, 65–66.—Clerc, 1907, 558 (Opistorchis).—Kamensky, 1900a, 4.—Kowal., 1898h, 143, 147 (40, 44) (in Homo, Canis vulpes fulvus).—Manson, 1903e, 635 (=Dist. conjunctum of man).—Rail., 1896, 160.

conus (Crep., 1825) Stiles & Hass., 1895c, 156–158.—Rail. & Marotel, 1898, 38.

corvina (Stiles & Hass., 1894) Kowal., 1898, 143, 148 (40, 45) (in Corvus americanus, C. ossifragus).

corvinus (Stiles & Hass., 1894) Stoss., 1904, 12.

crassiuscula (Rud., 1809) Kowal., 1898g, 71, 73; 1898h, 130, 131, 143, 144, 147 (27, 28, 40, 41, 44) (in Buteo vulgaris, Archibuteo lagopus, Haliaëtos albicilla, Circus rufus, Aquila imperialis, Surnia nyctea).—Jacoby, 1899c, in 1–30; 1900, 7.—Looss, 1899b, 565, 678.—Luehe, 1899, 530.

crassiuscula janus Kowal., 1898h, 122–132, 147 [19–27, 44] figs. 15–21, 28 (in Anas boschas dom.); 1898g, 71.—Braun, 1902b, 9.—Looss, 1899b, 565, 566 (undoubtedly a Metorchis), 678.

crassiusculus Looss, 1899b, 678, see crassiuscula.

entzi Ratz, 1900, 534, in gall ducts of Ardea purpurea.

exigua (Mueh., 1898) Kowal., 1898h, 147 (44) (in Circus rufus).

felinea (Riv., 1884) Jacoby, 1899c, in 1–30.

felineus (Rivolta, 1884) R. Bl., 1895, 217; 1895, 734–735; 1900, 488.—Askanazy, 1900b, 493, 502 (in man); 1904, 689–691; 1904, Nov., 229–230.—Bossuat, 1902, v. 6 (2), 188.—Braun, 1903, 3 ed., 157 (syns.: conus Gurlt, lanceolatum Sieb., 1836 & Tright, sibiricum, tenuicolle Mueh., 1896) 159 (cases in man); 1906, 166; 1906, 163–166, figs. 95–98 (in Limnæus stagnalis, Felis domestica, dog, fox, Gulo borealis).—Engler, 1904 (X. 21), 186–188, 1 fig. (abnormal intestine of); 1905, Jan. 1, 16; 1905 (II), 57.—Galli-Valerio, 1898d, 146; 1901c, 364 (in dog).—Hollack, 1902a, 868.—Jacoby, 1900, 7, 8–9.—de Jong, 1896a, 7 (Opistorchis).—Kamensky, 1900a, 17, 19, 20, 24 (felinea).—Looss, 1899b, 675; 1905, 89 (syns.: Dist. felineum, D. sibiricum; in dogs and cats, Europe; in man by Winogradow in Tomsk, Siberia), 90; 1907, Feb. 1, 138, 139.—Stiles, 1902, 33.—Ward, 1903, 704; 1903, 864, 869 (syns.: Dist. conus Gurlt nec Crep., D. lanceolatum Sieb., 1836 & Tright, 1889 nec Mehlis, D. sibiricum Winogradoff, D. tenuicolle Mueh.), 871.

gemina (Looss, 1896) Kowal., 1898h, 129, 148 (26, 45) (in Milvus parasiticus).

geminus (Looss, 1896) Looss, 1899b, 676, 677, 678, figs. 2, 3; 1907, Feb. 1, 138, 139 (in Anas boschas fera, Circus æruginosus, Milvus ægyptius).—Braun, 1901b, 34.

interruptus Braun, 1901g, 897 (in Alcedo viridirufa, Ardea virescens; Brazil); 1902b, 5, 6, fig. 2.—Stoss., 1904, 11.

janus Kowal., 1898g, 71, 73; 1898h, 130, 131, 132, 133, 134, 137, 138, 139, 143, 144 (22, 26, 27, 28, 29, 30, 31, 34, 35, 36, 40, 41).—Jacoby, 1900, 7.—See also crassiuscula janus.

OPISTHORCHIS—Continued.

lancea (Dies., 1850) Braun, 1901, 897; 1902b, 6, 7.—Hollack, 1902a, 868.—Stoss., 1904, 11.

longissimus (Linst., 1883) Stiles & Hass., 1896, 155.—Kamensky, 1900a, 5.—Kowal., 1898g, 72; 1898h, 140, 141, 148 (37, 38, 45) (in Botaurus stellaris).—Looss, 1899b, 564, 674.—Stoss., 1904, 11.

longissimus var. *corvinus* (Stiles & Hassall, 1894) Looss, 1899b, 564, 675.—Hollack, 1902a, 868.—Stoss., 1904, 12.

noverca Braun, 1902, Dec. 30, 836; 1903, 3. ed., 164, fig. 112 (=Dist. conjunctum Lew. & Cunn., 1872 of man, renamed); 1906, 170–171, figs. 103–104.—Looss, 1905, 90–91, fig. 6 (syn. Dist. conj. L. & C.).—Stoss., 1904, 11.—Ward, 1903, 704; 1903, 864, 870.

oblonga (Cobbold, 1858) Kowal., 1898h, 148 (45) (in Phocæna communis, Platanista gangetica).

pianæ Galli-Valerio, 1898c, 7–8, 1 fig. (in Anas boschas; Busto Ariizio); 1898d, 145–146 (in Anas boschas); 1898e; 1898m, 923 (Opistorchis); 1901c, 364; 1903d, 59 (Opistorchis).—Kowal., 1898c, 751–752; 1898d, 751–752; 1898e, 923.—Stoss., 1899, 12.

piscicola Odhn., 1902, 152–153 (in Gymnarchus niloticus).—Stoss., 1904, 11.

poturzycensis Kowal., 1898g, 71 (var. of simulans), 72 (n. sp.), 73, 75, or 1898h, 138, 140, 141, 142, 143, 144, 148 (in Anas boschas dom.), 150, 163, figs. 23–26 (35, 36, 37, 38, 39, 40, 41, 47).—Engler, 1904, 186.—Jacoby, 1899c, in 1–30; 1900, 7.

pseudofelineus Ward, 1901, 180 (syn. D. felineum Riv. of Ward, 1895, 152–158); in 1903, 861, 862, 869.—Braun, 1903, 3 ed., 158.

simulans (Looss, 1896) Kowal., 1898g, 72; 1898h, 129, 137, 140, 141, 142, 148 (26, 37, 38, 39, 45) (in Pernis apivoris); 1902d, 23 (5) (in Anas boschas dom.).—Braun, 1901b, 34.—Looss, 1899b, 564, 566, 673–674, pl. 24, figs. 1–1b (includes var. poturzycensis).—Stoss., 1904, 11.—Also reported for Anas penelope, Circus æruginosus, Fulix cristata).

simulans var. *poturzycensis* Kowal., 1898g, 71 (in Anas boschas dom.); 1898h, 135–142, 148 (32–37, 45), figs. 23–26 (in Anas boschas dom.).—Looss, 1899b 565, 673, 674.

sinensis (Cobbold, 1875) R. Bl., 1895, 217; 1895, 736–737; 1900, 488; 1901b, 204, 209, 210; 1901c, 581, 586, 587, 588, 589.—Akanuma, 1894 (in Toyama Province).—Aoyama, 1891a.—Askanazy, 1904, 689; 1904 (XI), 229–230.—Bossuat, 1902, v. 6 (2), 189.—Braun, 1903, 3. ed., 161–162, figs. 109–111; 1906, 168–170, figs. 100–102.—Clerc, 1907, 558 (Opistorchis).—Kamensky, 1900a, 4.—Kowal., 1898h, 147 (44) (in Homo sapiens; Felis catus dom.).—Looss, 1899b, 564; 1901, 209; 1905, 90, fig. 5 (syns. Dist. sinense Cobb., D. spathulatum Leuck., D. hepatis innocuum, D. hepatis endemicum, D. hepatis perniciosum Bælz, D. japonicum Bl.) (Japan, Annam, Tonkin, China, Korea); 1905m, 233; 1907, Feb. 1, 136–147.—Manson, 1903, 635.—Staf., 1905, Apr. 11, 694 (in liver of Chinaman, at Montreal, 1896).—Stiles & Garrison, 1906a, Aug., 29.—Stoss., 1904, 11.—Ward, 1903, 864, 867, 869–870 (syns. Dist. sinense Cobb., D. spathulatum Leuck. nec Rud., D. hepatis endemicum Bælz, D. hepatis perniciosum Bælz, D. hepatis innocuum Bælz, D. japonicum Bl., D. endemicum Ijima); 1903, 703, 704.—Woolley, 1906, 1090 (Opiscorcus).

speciosus Stiles & Hass., 1896, 151–155, figs. 1–2 (Dist. longissimum corvinum renamed).—See p. 74.

tenuicollis (Rud., 1819) Stiles & Hass., 1896, 155.—Braun, 1901c, 314.—Jacoby, 1900, 8.—Kamensky, 1900a, 1–23 (syn. D. felineum Riv.); 1900b, 23 pp.; 1901a, 323–324.—Kowal., 1898g, 73, 74; 1898h, 106, 129, 138, 139, 143, 144, 147 (1, 26, 35, 36, 40, 41, 44) (in Homo, Felis catus dom., Canis familiaris, Gulo borealis, Phoca barbata, Halichœrus grypus).—Looss, 1899b, 564, 566, 674–678, 700.—Odhn., 1905, 339.—Ratz, 1900, 532.—Stoss., 1904, 11.

tenuicollis-felineus Looss, 1899b, 678 (see tenuicollis and felineus).

truncatus (Rud., 1819) Rail., 1896, 160.—Bossuat, 1902, v. 6 (2), 192.—Galli-Valerio, 1898d, 146; 1901c, 364.—Jacoby, 1899c, in 1–30; 1900, 8.—de Jong, 1896a, 7 (Opistorchis).—Kamensky, 1900a, 14 (truncata).—Kowal., 1898h, 143, 147 (40, 44) (in Gulo borealis, Felis catus dom., Canis familiaris, C. vulpes, Phoca annelata, P. vitulina).—Luehe, 1899, 530.

OPISTHORCHIS—Continued.

viverrini (Poir., 1886) Stiles & Hass., 1896, 155.—Kowal., 1898h, 148 (45) (in Felis viverrinus).—Poir., 1886, 27–29, pl. 3, figs. 1–3.—Stoss., 1892, 1893, 24; 1904, 11.

xanthosoma (Crep., 1846) Kowal., 1898g, 72; 1898h, 134, 147 (31, 44) (in Podiceps minor).

xanthosoma var. *compascua* Kowal., 1898g, 71 (in Anas querquedula); 1898h, 132–134, 147 (29–31, 44), figs. 22–29.—Braun, 1902b, 8 (syn. of Dist. crassiusculum).—Looss, 1899b, 565, 566 (says this is undoubtedly a Metorchis), 678.

OPISCORCUS Woolley, 1906, Oct. 6, 1090 (misprint for Opisthorchis).

OPISTHOTREMA Fischer, 1883a, 1–42 (m. cochleare).—Biehringer, 1888a, 231, 232, 233, 234.—Brand., 1892, 506.—Braun, 1892a, 569, 635, 640, 663, 664, 676, 677, 679, 683, 687, 693, 696, 699, 700, 711, 715, 716, 717, 718, 721, 725, 727, 728, 736; 1893a, 879, 886, 887, 890, 893, 895, 899, 914, 917, 918.—Darr, 1903, 657.—Gamb., 1896a, 73.—Jackson, 1888, 648.—Juel, 1889, 24.—Looss, 1885b, 56; 1894a, 180, 207; 1899b, 665.—Mont., 1888, 7, 15, 18, 32, 35, 37, 41, 42, 48, 50, 52, 53, 54, 56, 57, 58, 60, 64, 66, 67, 93, 106; 1892, Oct. 7, 214 (gen. of Monostomidæ); 1892, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 713; 1892, 37, 38; 1893, 25, 83, 144.—Ofenheim, 1900, 156.—Pratt, 1902, 890, 909.

1893: Oposthotrema Crety, 1893a, 384, misprint.

1902: Opistotrema Cohn, 1902k, 53, for Opisthotrema.

cochleare Fischer, 1883a, 1–42, 1 pl., 13 figs. (in Halicore dugong; Philippines); 1884a.—Bettend., 1897, 38; 1897, 342.—Biehringer, 1888a, 230.—Brand., 1891b, 265.—Braun, 1891d, 421; 1892a, 583, 589, 591, 593, 594, 595, 602, 604, 605, 607, 610, 628, 640, 659, 688, 703, 724, 731, 733, 762, 763, 764, 765; 1893a, 877, 917; 1893d, 468; 1901e, 344.—Cohn, 1902k, 53 (Opistotrema).—Crety, 1893a, 384 (Oposthotrema).—Darr, 1902, 648.—Juel, 1889, 37.—Kath., 1894a, 143.—Kowal., 1898h, 158 (55).—Linst., 1904u, 679, 680.—Looss, 1885b, 10, 12, 17, 56.—Maclaren, 1904b, 608.—Mont., 1888a, 7, 16, 21, 23, 26, 27, 43, 60; 1892, 99, 104; 1892, 688, 689, 695, 703, 712; 1893, 16, 109.—Ssinitzin, 1904, 768 (Opistotrema).—Reported also for Manatus americanus.

pulmonale Linst., 1904u, 678–680, figs. 1–2 (in Halicore australis; Torres-Strasse, Australia).—Odhn., 1906, 66.

OPISTORCHIDÆ Jægers., 1903a, 15, for Opisthorchiidæ.

OPISTORCHIS Rail., 1896, 160, see Opisthorchis.

OPOSTHOTREMA Crety, 1893a, 384, for Opisthotrema.

ORCHIDASMA Looss, 1900, Dec. 3, 602 (Anadasmus Looss nec Walsingham renamed, hence type amphiorchis), τὸ δάσμα, die Vertheilung; 1902m, 468.—Braun, 1901a, 20, 34.—Odhn., 1905, 342.—Pratt, 1902, 888, 895.

amphiorchis (Braun, 1899) Braun, 1901b, 20–22, figs. 7, 11 (in Thalassochelys corticata; Chelone mydas; Triest).—Looss, 1901, 560, 562, 563; 1902m, 414, 416, 463–468, pl. 23, figs. 25–29, pl. 39, fig. 24.—Odhn., 1905, 342.

ORCHIPEDUM Braun, 1901g, 944 (m. tracheicola Braun); 1902b, 15, 19, 20, 22, 23.—Pratt, 1902, 888 related to Psilostominæ), 897.

tracheicola Braun, 1901g, 943–944 (in Anas fusca; Vienna, Oct.); 1902b, 19, 20, 22, 23, figs. 14, 15 (syn. Monost. flavum).

OROPHOCOTYLE Looss, 1902e, 637–644, figs. 1–4 (tod. planci); 1902f, 400–401; 1905g, 54–55.

calyptrocotyle (Mont., 1893) Looss, 1902e, 644.

divergens Looss, 1902e, 640, 643, 644, fig. 1 (in Ranzania truncata; Triest).

foliata (Lint., 1898) Looss, 1902e, 644 (syn. Dist. foliatum Lint.).

planci (Stoss., 1899) Looss, 1902e, 637–641, figs. 2–4 (in Ranzania truncata; Triest).

ORTHOSPLANCHNUS Odhn., 1905, 330, 345, 346, 347, 348 (tod. arcticus).

arcticus Odhn., 1905, 339–343, 344, 348, pl. 3, figs. 1–5 (in Phoca barbata; west coast Spitzbergen).

fraterculus Odhn., 1905, 343–344, 348, pl. 3, fig. 6 (in Phoca barbata, Odobenus rosmarus; w. coast Spitzbergen).

OSTIOLUM Pratt, 1902a, 888 (Haplometrinæ), 900 (key to); 1903, 34–37 (m. formosum Pratt).

formosum Pratt, 1903, 34–37, pl. 4, figs. 6–8 (in frogs).—Staff., 1905, Apr. 11, 687 (in lungs of American frogs and toads; probably identical with Pneumonœces medioplexus).

OTIOTREMA Setti, 1897, 4–8, figs. 1–5 (m. torosum); 1897, in 198–247.—Braun, 1902b, 23.—Fuhrmann, 1904, 61.—Looss, 1899b, 551, 644–645, 741, 742, 743, 744, 745, 1901b, 208, 209, 210; 1902e, 642; 1902m, 813.—Luehe, 1901n, 481, 482, 486.—Odhn., 1905, 366.—Ofenheim, 1900, 183.—Pratt, 1902, 889, 905.—Stiles & Hass., 1898a, 91–92, 96 (type torosum).

torosum Setti, 1897, 4–8, pl. 8, figs. 1–5 (in Squalus sp.; Massaua).—Darr, 1902, 661.—Looss, 1899b, 645, 735, 736–746, figs. 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 69 (in Squalus sp.; Sawakin).—Luehe, 1901n, 481.—Odhn., 1905, 362.—Stiles & Hass., 1898a, 91, 96.

OTODISTOMUM Staff., 1904, May 3, 482–483 (m. veliporum) (Ὦτος= giant) (closely related to Azygia).

veliporum (Crep., 1837) Staff., 1904, May 3, 482–483, 488 (in Raja lævis Mit.; Canada).—Odhn., 1905, 310.

PACHYPSOLUS Looss, 1901l, 30. Oct., 558–560 (m. lunatus Looss, 1901, 558 = D. irroratum R.); 1902m, 497, 503, 504, 505.—Pratt, 1902, 888 (related to Plagiorchiinæ), 899.

irroratus (Rud., 1819) Looss, 1902m, 414, 416, 485–505 (includes Dist. irroratum Rud., 1819a, 393; Braun, 1899, 717; 1901, 36, figs. 27, 30, 32), 793, 871, 887, fig. A, pl. 23, figs. 37–38, pl. 32, fig. 169 (in Thalassochelys corticata, at Triest; Thalassochelys caretta in New Guinea).—Odhn., 1905, 340.

lunatus Looss, 1901l, 558–560, 564 (in Thalassochelys corticata; Triest); 1902m, 485, 486, 496, 497, 503 (syn. of P. irroratus Rud.).

PARABASCUS Looss, 1907, Mar. 5, 481–483 (tod. lepidotus).

lepidotus Looss, 1907, Mar. 5, 481–483, figs. 3a–b (in Vesperugo kuhli; Cairo, Egypt).

limatulus (Braun, 1900) [Looss, 1907, Mar. 5, 483, as probable].

semisquamosus (Braun, 1900) [Looss, 1907, Mar. 5, 483].

PARAGONIMIASIS, name of disease (see also distomatosis, pulmonary) Stiles & Hass., 1900a, 578–600.—Huber, 1896, 577.—Inoue, 1892, 13, 15; 1893a, 79–86; 1897a, 175–178 (brain); 1900, 1–23 (distomatosis pulmonum); 1900b, 515, 664, 739; 1903, 124, 125, 130.—Katsurada, 1900, 507.—Kurimoto, 1893d, 1–6, 1 fig.—Kurimoto & Ijima, 1892a, (718–720).—Looss, 1905, 81, 82, 83.—Manson, 1883, (Mar. 31), 532–534; 1894, 805.—Matsushima, 1895a, 10–17 (induratio hepatis).—Maxwell, 1899, 116–117, 2 figs.—Miura & Nakanishi, 1897, 20 Aug., 31–33.—Stiles, 1901b, 79–102.—Taylor, 1884, 44–54, figs. 1–5.—Winoue, 1892, Oct. 20, 13–16.—Winoue & Katsurada, 1892, Nov. 5, 15–21.—Ztsch. d. Tokio med. Gesellsch., 1892, v. 6 (6), Mar. 20, Art. 1.—IN BRAIN: Inoue, 1897a, 175–178.—Inoue & Katsurada, 1891, (17); 1892, v. 6 (6); 1893; 1902, v. 6 (21).—Jida, 1899, (1).—Taniguchi, 1904, Mar. 31, 237; 1904, Aug. 1, 156; 1904, Aug. 16, 350–351; 1904, v. 38 (1), 100–121, 2 pls.; 1904, 318–321; 1904, Dec. 3, 983; 1905, July 29, 508–509.—Yamagiwa, 1889, Sept. 20, 8; 1890, Mar. 5, 447–460, figs. 1–3; 1890, May 20,—— ; 1890, Sept. 5, 336–337.

———, LOCALITY: Ijima, 1893, v. 7 (16) (Yamanashi).—Katsurada, 1900d, 507 (mountainous regions).—Miura & Nakanishi, 1897a, 31–33.—Soma, 1893 (Japan).—Sons., 1884, v. 54 (7), 17–21 (Japan & Formosa).—Stiles & Hass., 1900a, 560–611; 1900b; 1900c, 3017–3027 (U. S.); 1901a, 45 (U. S.).—Yamagiwa, 1892, Mar. 5, 446–456 (Japan).

———, PATHOLOGY: Katsurada, 1899a, 8–29.—Katsurada, Fujiro & Fujiki, 1899a, 20 June, 1–18; 5 July, 2–29.—Magaziner, 1902, Apr., 296–302 (in man and lower animals).—Taniguchi, 1893, (794–795) (eye and testicle).—Wakabayashi, 1903, Apr. 20, 117 (orbit and lid).

———, SYMPTOMS: Huber, 1896a, 577.

———, TREATMENT: Katsurada, Fujiro & Saki, 1899a, 141–185.—Riusai, 1884, no. 307 (sulphurous acid).

———, IN MAN: Emerson, 1904, July–Aug., 263.—Stiles & Hass., 1900a; 1902f, 360; 1904c, 22.

———, IN SWINE: Stiles & Hass., 1900a, 560–611.

PARAGONIMUS Braun, 1899g, 492 (tod. westermanii) (also places here, Dist. rude Dies., Dist. compactum Cobbold); 1900h, 5, 6; 1901e, 329, 330; 1903, 3. ed., 154–155; 1906, 160.—Looss, 1900d, 605; 1902m, 813.—Luehe, 1900, 555, 557.—Pratt, 1902, 887 (related to Fasciolinæ), 894.—Stiles, 1901, 183, 185.—Taniguchi, 1904, v. 38, —— (in brain); 1904 (XII, 3), 938.—Ward, 1903, 867.

PARAGONIMUS—Continued.

1899: Polysarcus Looss, 1899b, 561 (tod. westermanii).

compactus (Cobbold, 1859) Braun, 1901, 334.

rudis (Dies., 1850) Stiles & Hass., 1900a, 604–605.—Braun, 1901e, 329, 332, pl. 20, figs. 12, 15–17.

westermani (Kerbert, 1881) Looss, 1905, 81, 82, fig. 1; 83, 84, figs. 2–3; 85, 86 (syns. Dist. ringeri, D. pulmonale, D. pulmonum) (see westermanii); 1905m, 280, 282, 283.

westermanii (Kerbert, 1878) Stiles & Hass., 1900a, 560–611, figs. 24–28, pls. 23–24, figs. 1–4; 1900b, 761–762 (westermanni); 1900c, 3017–3027; 1901a, Jan. 12, 45.—Anders, 1903, 6th ed., 1245–1246.—Braun, 1901e, 331, 332, 333, 334; 1903, 3. ed., 155, figs., 101–103; 1906, 160–163, figs. 92–94 (westermani) (in man, Royal tiger, dogs, pigs, cats; N. America).—Darr, 1902, 652, 687 (westermanni).—[Kellicott, 1894a, 123 (in dog; U. S. A.).]—Looss, 1905, 81, 82, 83, 84, 85, 86, figs. 1–3 (westermanni) (syns. Dist. ringeri, D. pulmonale, D. pulmonum), 117; 1905m, 280, 282, 283 (westermani).—Manson, 1903, 631, 632, 633–636, figs. 96, 97 (westermanni).—Miura, 1897, 31–33.—Ricketts, 1903, in 1204–1206.—Stiles, 1901b, 79–102 (westermanii); 1902, 45, 47; 1904i, 14–18, figs. 5–16.—Stiles & Garrison, 1906a, 29.—Strong, 1901, 44–45.—Ward, 1903, 703, 704; 1903, 863, 864, 867 (syns. Dist. westermanii Kerbert, 1878; D. ringeri Cobbold, 1880; D. pulmonale Baelz, 1883; D. pulmonis K., S., & Y., 1881 Mesogonimus westermanii Rail., 1890), 868.

westermanni (Leuck., 1889) Stiles, 1900, 762 (see westermanii).

PARAMPHISTOMIDÆ Fischder., 1901a, 367–375; 1901b, 634–636; 1902a, 59 pp., 4 figs. (syn. Amphistomidæ Mont.); 1902b, 356; 1903h, 485–600, figs. a–q, pls. 20–31; 1903i; 1904, v. 20, 453–470; 1904, 278–279; 1904, 532–533; 1904, Feb. 18, 598–601; 1904, Mar. 3, 173; 1904, Mar. 10, 403; 1905, Jan. 31, 16; 1905, Jan. 16, 119; 1905, Jan., 120; 1905, July 3, 63.—Braun, 1903, 3. ed., 145, 146.—Luehe, 1901, 488.—MacCallum, 1905, 667.—Pratt, 1902, 887, 892 (includes: Paramphistominæ, Cladorchinæ).—Shipley, 1905, v. 6 (1), 4, 8.—Ward, 1903, 864 (Gastrodiscus hominis), 865 (see Digenea).

PARAMPHISTOMINÆ Fischder., 1901, 367; 1902a, 10 (subf. of Paramphistomidæ); 1903h, 490, 492, 503.—MacCallum, 1905, 668.—Pratt, 1902, 887, 892 (syns. Gastrothylax, Paramphist., Stephanopharynx).—Shipley, 1905, v. 6 (1), 8 (genera: Paramphist., Stephanopharynx, Gastrothylax).

PARAMPHISTOMUM Fischder., 1901a, 367, 370, 372, 373, 374; 1902a, 7, 10–11, 24, 25, 26, 38, 43, 54 (tod. cervi); 1903h, 490, 491, 492 (key), 503; 1904, 173; 1904, 403; 1904, 453–470 (3 species); 1904 (X), 532–533.—Looss, 1902m, 438, 780, 835.—Pratt, 1902, 887, 892.—Shipley, 1905, v. 6 (1), 7, 8.

bathycothyle Fischder., 1903h, 542, for bathycotyle.

bathycotyle Fischder., 1901a, 368, 370 (in Bos kerabau); 1902a, 15, 16, 22 (in B. k.; Ceylon); 1903h, 492, 498 (in B. k.; Ceylon), 518–520, pl. 20, figs. 8–9, 542 (bathycothyle); 1904, 454, 455, 456, 457, 458.

bothriophoron (Braun, 1892) Fischder., 1901a, 370; 1902a, 21–22, 25, 29 (in Zebu; Madagascar); 1903h, 492, 496, 498, 538–541, figs. 24–28 (in Bos taurus indicus; Annanarivo, Madagascar), 544, 545, 546, 549, 550, 571.

calicophorum Fischder., 1901a, 370 (in Bos taurus; East Africa and Capland, Queensland, China); 1902a, 22–23 (in Bos tau.); 1903h, 492, 498 (in Bos tau.; East Africa, Capland, Queensland), 509 (in Ovis aries? or Bos tau.), 541, figs. c, 29–35, 549, 550, 575 (in Bos tau.; Canton. Fu-mui, China), 580; 1904, 459.—Linst., 1906, 175 (in Bos indicus).

cervi (Schrank, 1790) Fischder., 1901a, 368, 369; 1902a, 11–13, figs. 1, 14, 15, 20, 22, 26, 42 (includes Festuc. cervi Zed., 1790; Monost. elaphi Zed., 1800; M. conicum Zed., 1803; Amphist. conicum Rud., 1809) (in Bos bubalus, B. taurus, B. urus, Cervus alces, C. dama, C. elaphus, Ovis aries); 1903h, 492, 498 (in Bos tau., B. urus=Bison europæus, B. bubalus; Egypt, ?Japan, ?N. Africa, ?Australia, ?India; Cervus elaphus, C. alces, C. capreolus, C. dama, Capra hircus; Ovis aries), 503, 504–515, fig. A, pl. 20, figs. 1–5 (syns. Fasc. hepatica Mueller, Fest. cervi Zed., Fasc. cervi Schrank, F. elaphi Gmelin, 1790; Monost. elaphi Zed., 1800; M. conicum Zed., 1803; Amphist. conicum Rud., 1809a, and of certain other authors), 530, 534, 535, 537, 539, 543, 565, 566, 590; 1904, 459, 460, 461, 462.—Braun, 1906, 142 (in Bos taurus).—Staff., 1905, Apr. 11, 693 (syn. Amphist. conicum Rud.) (in stomach of cattle; Canada).

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cotylophorum Fischder., 1901a, 370 (in Bos taurus, Togo; Bos zebu, German East Africa); 1902a, 23 (in B. t., Togo; B. z., German E. Africa); 1903h, 492, 499 (in Bos taurus, B. t. indicus; East Africa), 546–551, figs. f, 36–39 (in B. t., Togo, Misahöhe; B. zebu; Africa, Langenburg); 1904, 460, 463, 464, 465.

dicranocœlium Fischder., 1901a, 369 (in Bos taurus indicus; Coll. Berlin Vet. School); 1902a, 18–19, 23 (in B. t. ind.); 1903h, 492, 499 (in B. t. ind.), 528–531, fig. d, pl. 21, figs. 5–17 (in B. t. ind.), 533, 534, 547; 1904, 458, 464, 465, 467.

epiclitum Fischder., 1904, 458–463, pl. 15, figs. 4–6, fig. B (in Bos taurus indicus, Buffelus indicus; Saigon, Cochin China).

explanatum (Crep., 1847) Fischder., 1904, 454–458, pl. 15, figs. 1–3, fig. A (in Bos taurus indicus, B. zebu, Buffelus indicus).

gracile Fischder., 1901a, 368 (in Bos kerabau from Ceylon; Portax tragocamelus); 1902a, 16–17, 18–19 (in B. k., Ceylon; Portax trag.); 1903h, 492, 499 (in B. k., Ceylon, Por. trag.), 520–524, fig. B, pl. 21, figs. 10–11, 532, 535.—Linst., 1906, 175.

liorchis Fischder., 1901a, 368 (in Cervus simplicicornis, C. campestris, C. mexicanus, C. rufus, C. dichotomus, C. namby; Brazil); 1902a, 13–14 (syn. Amphist. conicum Dies. e. p.); 1903h, 492, 499, 515–518, pl. 20, figs. 6–7 (in same hosts).

microbothorium Fischder., 1902a, 21 (for microbothrium).

microbothrium Fischder., 1901a, 369 (in Antelope dorcas; Coll. Vien. and Coll. Berl. Vet. School); 1902a, 20–21 (microbothorium); 1903h, 492, 499, 535–538, pl. 22, figs. 21–23 (in Antilope dorcas), 539, 540, 541, 542.

orthocœlium Fischder., 1901a, 369 (in Bos kerabau); 1902a, 17–18, 19, 20 (in Bos kerabau; Ceylon); 1903h, 492, 499, 524–528, fig. C, pl. 21, figs. 12–14 (in Bos kerabau; Ceylon, Kœnigsberg i. Pr.), 529, 530, 531, 532, 534; 1904, 467.

scoliocœlium Fischder., 1904, 459, 463–468, pl. 16, figs. 7–11, fig. C (in Buffelus indicus, in Cochin China and Annam; Bos taurus, at Annam).

strephocœlium Fischder., 1902a, 19–20, 25, 50 (in Bos kerabau; Ceylon) for streptocœlium.

streptocœlium Fischder., 1901a, 369 (in Bos kerabau; from Ceylon); 1903h, 492, 499, 531–534, pl. 21, fig. 18, pl. 22, figs. 19–20 (in Bos ker.), 537, 539, 540; 1904, 465.

PARORCHIS Nicoll, 1907, 128, Zeugorchis Nicoll, 1906, not Staff., 1905, renamed, hence type acanthus.

PATAGIUM Heymann, 1905, 82, 90 (m. brachydelphium).

brachydelphium Heymann, 1905, 81, 82–89, pl. 6, figs. 1–3 (in Dermatemys mavii Gray; Coll. Kœnigsberg i. Pr.).

PECTOBOTHRIA Braun, 1893b, 188, for Pectobothrii.

PECTOBOTHRII Burm., 1837a, 530; 1856a, 243, 251.—Braun, 1890a, 515, 516; 1893b, 188 (Pectobothria).—Mont., 1888a, 83.—Tasch., 1879, 233.

PEDICELLINÆ Mont., 1888a, 88.

PEGOSOMUM Ratz, 1903, v. 1, 417–432, 1 pl. (type by present designation saginatum), Fasciolidæ.

asperum (Wright, 1879) Ratz, 1903, 423–424, 431–432 (in Botaurus minor).

saginatum (Ratz, 1898) Ratz, 1903, 419–421, 427–429, pl. 16, figs. 2, 4 (in Ardea alba; Hungary).

spiniferum Ratz, 1903, 422–423, 429–431, pl. 16, figs. 1, 3 (in Botaurus stellaris; Hungary).

PETRATHYRUS Cobbold, 1860a, 42, for Tetrathyrus.

obesus (Crep., 1851) Cobbold, 1860a, 42, renamed Monost. gurltii.

PEUDOCOTYLE Tasch., 1879, 65, apparently for Pseudocotyle.

PHACUS Nitzsch, 1827, 69, contains Cerc. pleuronectes, C. tenax.

PHANEROPSOLUS Looss, 1899b, 608–609, 611, 612, 633 (tod. sigmoideus) *φανερός*= visible; *ὁ ψωλός*=penis); 1902m, 822, 823.—Braun, 1900, 234; 1901, 948; 1901e, 311, 313; 1901, 567.—Pratt, 1902, 889, 903, 904.

longipenis Looss, 1899b, 608, 714–715, fig. 35 (in ape, gen. et sp. undetermined; Gizeh Zool. Garden); 1902m, 823.—Braun, 1901e, 311, 313.

PHANEROPSOLUS—Continued.

micrococcus (Rud., 1819) Braun, 1901, 567; 1902b, 41, 49, 62, 64, fig. 40 (syns. Dist. mi. Rud., 1819; Dies., 1850a; D. (Brachylaimus) mi. Stoss., 1892).

orbicularis (Dies., 1850) Braun, 1901e, 348, pl. 20, fig. 14.

oviformis (Poir., 1886) Looss, 1899b, 609.

sigmoideus Looss, 1899b, 608, 712–713, 714, fig. 31 (in Passer dom. at Alexandria; Caprimulgus europæus at Cairo); 1902m, 823, 824 (probably = Dist. micrococcum Rud., see Braun).—Braun, 1901e, 311, 313; 1901, 567; 1902b, 63, 64.—Staff., 1905, Apr. 11, 693.

PHASCIOLA Wilder, 1894 (for Fasc.).—Stiles & Hass., 1898a, 89, 92 (syn. of Fasc.).

PHILOPHTHALMINÆ Looss, 1899b, 586–587; 1902m, 839.—Braun, 1902b, 31.—Luehe, 1901, 488.—Odhn., 1905, 314.—Pratt, 1902, 888, 898 (includes: Philophthalmus, Pygorchis).—Shipley & Hornell, 1904, 95.

PHILOPHTHALMUS Looss, 1899b, 587 (tod. palpebrarum).—Braun, 1902b, 31, 32.—Ofenheim, 1900, 182.—Pratt, 1902, 888, 898.

lachrymosus and *lacrymosus* Braun, 1902b, 31, 37 (Dist. lucipetum Braun p. p. in Larus maculipennis; Brazil).—Looss, 1907, Mar. 5, 480.

lucipetus (Rud., 1819) Looss, 1899b, 587, 701, 702; 1907, Mar. 5, 480.—Braun, 1902b, 32, figs. 21–23 (syns. Dist. lucipetum Rud., 1819a; Brem., 1824; Dies., 1850; Braun, 1897; D. (Dicrocœlium) luc. Duj., 1845; Stoss.)

nocturnus Looss, 1907, Mar. 5, 479–480, fig. 2 (in Athene noctua; Egypt).

palpebrarum Looss, 1899b, 587, 701–702, fig. 24 (in Corvus cornix at Cairo; Milvus parasiticus); 1901, 205; 1907, Mar. 5, 479, 480 (in Athene noctua; Egypt).—Braun, 1902b, 31, 32, 37.

PHYLLINE Abildg., 1790, 31 (syns. Tænia laticeps Pallas, Caryophyllus Gœze, Fasc. fimbriata Gœze).—Audouin, 1828a, 454–455.—Baer, 1827b, 674.—Baird, 1853a, 97 (=Caryophyllæus mutabilis Rud.).—Ben., 1858a, 1861a, 12, 19, 20.—Ben. & Hesse, 1864, 67 (of Oken, syn. of Nitzschia elegans).—R. Bl., 1888, 130 (of Oken, = trematode).—Braun, 1890a, 515, 518, 527.—Burm., 1856a, 251.—Dies., 1850a, 290, 426 (of Oken, syns. Hirudo Mueller, Epibdella Blainv., Trist. Rathke), 428 (of Oken, syn. of Trist.), 445 (of Oken, syn. of Malacobdella), 577 (of Abildg., syn. of Caryophyllæus), 578 (of Abildg., syn. of C. mutab.); 1858e, 313, 363 (of Oken, mentions only hippoglossi); 1859c, 437.—Fabricius, 1794, 30.—Goldb., 1855a, 20.—Johnston, 1865, 32.—Mont., 1888a, 84, 87; 1902, 138, 143; 1905, 75, 76.—Nitzsch, 1826, 150.—Odhn., 1905, 371 (of Oken, type is diodontis=Trist. maculatum).—Rud., 1809a, 24.—Stoss., 1898, 6 (of Oken).—Tasch., 1878, 563, 566 (syn. of Trist. maculatum=Capsala martinieri).

1891: Phyllinic Sons., 1891, 262, for Phylline.

bumpusii (Lint., 1900) Linst., 1903, 355.

caligi Kroyer.—Ben., 1858a, 1861a, 13 (syn. of Udonella caligarum Johnston).

coccinea (Cuvier, 1817) Schweigger, 1820, 474.—Dies., 1850, 429 (syn. of Trist. rudolphianum).—Johnston, 1865, 33.—Stoss., 1898, 5.—Tasch., 1878, 567 (cocinea) (syn. of T. molæ).

cocinea Tasch., 1878, 567 (for coccinea).

diadema (Mont., 1902) Linst., 1903, 355.

diodontis Oken, 1817, 182, 370, pl. 10, fig. 3 (based on Martinière, 1787a, 207–208, figs. 4–5, on Diodon sp.; Nolka to Monterey, Cal.).—Des., 1850a, 430 (syn. of Trist. maculatum Rud.).—Nitzsch, 1826, 150.—Odhn., 1905, 371.—Tasch., 1878, 567 (syn. of Trist. mac. Rud.).

grossa (Mueller, 1788) Johnston, 1865a, 35.—Dies., 1850a, 445 (to Malacobdella).—Leidy, 1852, 209 (= Malacobdella grossa Blainv.).

hendorffii Linst., 1889e, 163–180, pls. 10–11 (anatomy) (on Coryphæna hippurus; Caleta buena, Chile); 1893f, 170–172.—Braun, 1890a, 421, 426.—Mont., 1891, 126.

hippoglossi (Mueller, 1776) Oken, 1815.—Ben., 1858a, 1861a, 21 (to Epibdella).—Ben. & Hesse, 1864, 69 (to Epibdella).—Dies., 1850a, 426–427 (syns. Epibdella hipp. Blainv., Hirudo hipp. Mueller, Trist. hamatum Rathke); 1858e, 363; 1859c, 437 (in Hippoglossus vulgaris; Belgium).—Johnston, 1865a, 32; ——, 431, pl. 15, figs. 1–3.—Kœlliker, 1849, 21.—Linst., 1903, 355.—Moq.-Tandon, — , 392.—Nord., 18—, 526.—Odhn., 1905, 370 (to Epibdella), 371.—Tasch., 1878, 564, 565, 568 (to Trist.).—Thompson, ——, 482.—Reported also for Hippoglossus gigas, H. maximus.

PHYLLINE—Continued.

monticellii Par. & Perugia, 1895, 2.—St.-Remy, 1898, 534 (to Epibdella).—Stoss., 1898, 7 (in Mugil auratus; Triest).

sciænæ (Ben., 1856) Sons., 1891, 263 (in Sciæna umbra, Umbrina cirrhosa), 262 (Phyllinic).—Linst., 1889a, 76 (syn. of Benedenia elegans).

soleæ (Ben. & Hesse, 1863) Linst., 1903, 355.

squamula (Heath, 1902) Linst., 1903, 355.

PHYLLOCOTYLE Ben. & Hesse, 1863, 1864, 96, 103 (m. gurnardi).—Braun, 1890a, 413, 477, 516, 517, 523, 534, 536, 546; 1893a, 890.—Cerf., 1895h, 918; 1896, 514.—Gamb., 1896a, 73.—Hoyle, 1890, 539.—Mont., 1888a, 7, 8, 11, 66, 67, 86, 89, 100; 1892, Oct. 7, 213 (g. of Octocotylinæ); 1903, 336 (subf. Plectanocotylinæ); 1905, 76, 77, 78.—Pratt, 1900, 651 (on gills of marine fishes), 656, fig. 29.—Scott, T., 1901, 147.—Tasch., 1879, 69; 1879, 239, 247.

gurnardi Ben. & Hesse, 1863; 1864, 103–104, pl. 10, figs. 1–7 (in Trigla gurnardus).—Braun, 1890a, 418, 536, 548.—Mont., 1888a, 8, 13, 16; 1905, 76.—Pratt, 1900, 656, fig. 29; 657.—Scott, 1901, 147–148, pl. 8, fig. 23 (in Trigla gurnardus); 1905, 115–116, pl. 6, figs. 19–20 (in Trigla gurnardus); 1905, 116 (of Scott, 1901, 147, pl. 8, fig. 23) (syn. of Plectanocotyle lorenzii).—Tasch., 1879, 247 (in Trigla gurnardus).

PHYLLODISTOMUM Braun, 1899g, 492 (tod. folium) (Braun also places here: D. cygnoides Zed., after Looss, 1894, 23; D. cymbiforme Rud.; D. patellare Sturg.); 1901b, 9–10.—Looss, 1900d, 605; 1901b, 202, 203, 204, 207 (Gorgoderinæ; folium, patellare); 1901l, 557, 558; 1902m, 476, 477, 478, 479, 480, 515, 795, 797, 813, 814, 824, 827, 844, 847, 856, 857, 858, 859, 860, fig. 3; 861, 862 (Gorgoderinæ).—Odhn., 1901, 64, 65, 66, 67; 1902, 37; 1902, 64, 65, 66.—Pratt, 1902, 888, 900, 901.—Stiles, 1901, 183, 185.—See also Rhopalocerca.

1899: Spathidium Looss, 1899b, 605 (folium) [not Duj., 1841].

acceptum Looss, 1901b, 203 (in bladder of Crenilabrus pavo, C. griseus at Triest); 1901d, 404–405, fig. 4; 1902m, 480, 782, 798, 844, 857.—Odhn., 1901, 66; 1902, 66.

americanum Osborn, 1903, 252–258, figs. 1–4 (in Amblystoma punctatum; Minnesota); 1903, 532–533 (in A. tigrinum Green; Minnesota).

conostomum (Olss., 1876) Looss, 1902m, 857.

cymbiforme (Rud., 1819) [Braun, 1899, 492] Luehe, 1900, 564; 1901b, 10–13, fig. 1.—Looss, 1902m, 469 (to Plesiochorus, type).

folium (Olfers, 1816) Braun, [1899, 492:] 1901, 947; 1902b, 146.—Looss, 1901, 202; 1902m, 480, 782, 797, 798, 827, 857, 862.—Luehe, 1901, 54.—Osborn, 1903, 252, 254, 255; 1903, 533.—Ssinitzin, 1905, 75, 101, 108; 1906, 683 (near Warschau), 684 (in Cottus gobio, Dreissenia polymorpha), 685 (to Gorgoderina).—Staff., 1904, May 3, 492 (in bladder of Esox lucius; Canada).

linguale Odhn., 1902, 66 (in Gymnarchus niloticus; Omdurman, Sudan).—Looss, 1902m, 480, 857, 861.

patellare (Sturges, 1897) [Braun, 1899, 492].—Looss, 1901b, 202; 1902m, 480, 844, 857.—Osborn, 1903, 252, 254, 255; 1903, 533.

spatula Odhn., 1902, 66–67 (in Bagrus docmac, B. bayad; Omdurman, Sudan).—Looss, 1902m, 480, 861 (type of Catoptroides).—Osborn, 1903, 254; 1903, 533.

spatulæforme Odhn., 1902, 67–68 (in Malapterurus electricus; Omdurman, Africa).—Looss, 1902m, 480, 861 (to Catoptroides).

superbum Staff., 1904, 492 (in Ameiurus nebulosus, Perca flavescens; Canada; fish probably brought to Montreal).

unicum Odhn., 1902, 66 (in Serranus sp.; Tor in Sinai, Red Sea).—Looss, 1902m, 480, 857, 861.—Osborn, 1903, 255; 1903, 533.

PHYLLONELLA Ben. & Hesse, 1863; 1864, 65, 66, 70–71 (m. soleæ).—Braun, 1890a, 412, 414, 469, 471, 475, 490, 498, 511, 516, 517, 519, 523, 526, 527.—Gamb., 1896a, 73.—Massa, 1906, 43.—Mont., 1888a, 7, 10, 13, 20, 66, 86, 87, 97; 1892, Oct. 7, 172, 213 (syn. of Epibdella); 1899, 98; 1902, 139 (Phylonella), 140, 142; 1903, 335 (=Epibdella).—Pratt, 1900, 848.—Tasch., 1878, 566 (syn. of Trist.) (Phylonella).—Scott, T., 1901, 142.

1878: Phylonella Lorenz, 1878a, 434.

hippoglossi (Mueller, 1776) Goto, 1899, 264–269, pl. 20, figs. 1–7.—Linst., 1903, 280.—Mont., 1902, 140; 1905, 75, to (Epibdella).

PHYLLONELLA—Continued.

soleæ Ben. & Hesse, 1863; 1864, 70–71, pl. 5, figs. 1–8 (in Solea vulgaris).—Braun, 1890a, 409, 418, 424, 446, 465, 475, 512, 519, 528, 547, 552.—Cunningham, 1890a, 93–96, figs. C–D.—Goto, 1899, 266.—Lorenz, 1878a, 434.—Mont., 1892, 106, 115, 124, 125, 126 (to Epibdella); 1902, 139 (to Epibdella).—Pratt, 1900, 655, 657, fig. 6.—Scott, 1901, 142–143, pl. 8, fig. 17 (in S. v.; Clyde River); 1901, 344 (in Solea vulgaris; Irish Sea); 1905, 118 (in Scott, 1901, pl. 8).—Tasch., 1878, 564, 568 (Phylonella) (to Trist.).

PHYLONELLA Lorenz, 1878a, 434, for Phyllonella.

PINTNERIA Poche, 1907, Jan. 4, 125, Hoploderma Cohn, 1893, not Michælis, renamed, hence type mesocœlium.

PLACOPLECTANUM Dies., 1858e, 315, 384 (Discocotyle, 1850, renamed, hence type sagittatum; also type by first species rule and because it is the only positive species).—Braun, 1890a, 518.—Tasch., 1879, 239.

hirundinaceum (Bartels, 1834) Dies., 1858e, 384, to (Discocotyle).

leptogaster (Leuck., 1830) Dies., 1858e, 384 to (Discocotyle).—Tasch., 1879, 245 (to Octobothrium).

sagittatum (Leuck., 1842) Dies., 1858e, 384.—Tasch., 1879, 244 (to Octobothrium).—Linst., 1879 (reported for Catostomus teres).

PLACUNELLA Ben. & Hesse, 1863; 1864, 65, 66, 71–74 (pini type by page precedence).—Braun, 1890a, 411, 412, 415, 469, 498, 511, 516, 517, 519, 523, 526, 528; 1891d, 422.—Gamb., 1896a, 73.—Massa, 1903, 252; 1906, 43, 44, 51 (syn. of Trochopus), 58 (Ptacunella).—Mont., 1888a, 7, 10, 11, 13, 52, 66, 86, 87, 97; 1891, 104, 105, 107, 111; 1899, 98; 1903, 335 (=Trochopus).—Par. & Perugia, 1890, 13.—Par. & Mont., 1902, Dec., 46.—Pratt, 1900, 646, 648.—St.-Remy, 1898, 534.—Scott, T., 1901, 143.—Stoss., 1898, 7–8.—Tasch., 1878, 566 (syn. of Trist. Cuv.).

1906: Ptacunella Massa, 1906, 58, misprint.

exacantha Mont., 1891, 104, for hexacantha.

hexacantha Par. & Perugia, 1889, 740–741, fig. 1 (in Serranus gigas; Genova); 1890, 740–741, fig. 1; 1890, 5; 1894, 594.—Braun, 1890a, 418, 528, 547, 552.—Massa, 1906, 47, 59 (to Trochopus).—Mont., 1891, 1892g, 104, pl. 6, fig. 31 (exacantha).—Par., 1899, 3; 1902, 2 (in S. g.; Elba).

pini Ben. & Hesse, 1863; 1864, 72, 73, pl. 5, figs. 9–18 (in Trigla pini).—Braun, 1890a, 418, 465, 528, 547, 552.—Par. & Perugia, 1889, 740; 1890, 740; 1890, 5; 1899, 3.—Massa, 1906, 57 (to Trochopus), 64 (of Scott, 1901, 344) (syn. of Trochopus diplacanthus Massa).—Mont., 1888a, 11.—Par., 1902, 2 (in Trigla hirundo; Elba).—Pratt, 1900, 655, 657, fig. 8.—Scott, 1901, 344–345, 1 fig. (in Trigla hirundo; Irish Sea); 1901, 143 (in Trigla pini).—Tasch., 1878, 564–685 (to Trist.).

rhombi Ben. & Hesse, 1863; 1864, 73–74, pl. 6, figs. 1–7 (in Rhombus maximus).—Braun, 1890a, 412, 419, 465, 528, 547, 551.—Massa, 1906, 58 (to Trochopus).—Mont., 1888a, 11.—Tasch., 1878, 564, 568 (to Trist.).

vallei Par. & Perugia, 1895, (3) (in Naucrates ductor; Genova).—Looss, 1902m, 746.—Massa, 1903, 252; 1906, 44.—St.-Remy, 1898, 534.—Stoss., 1898, 8 (in Naucrates ductor; Trist.).—Type of Ancyrocotyle 1903.

PLACUNELLÆ Par. & Perugia, 1889, 740; 1890, 740.

PLAGIOPELTINÆ Mont., 1903, 336 (subf. of Octocotylidæ).

PLAGIOPELTIS Dies., 1850a, 289, 416–417 (m. duplicata); 1858e, 314, 368–369.—Ben. & Hesse, 1864, 84.—Braun, 1890a, 518, 546.—Cerf., 1895h, 920; 1896, 515.—Goldb., 1855a, 19.—Mont., 1903, 336 (syn. of Hexacotyle)—Tasch., 1879, 249 (syn. of Hexacotyle Blainv.).—See Hexacotyla.

duplicata (Rud., 1819) Dies., 1850a, 417 (includes Polyst. thynni Delaroche, 1811; Hexacotyla thynni Blainv.); 1858e, 369 (in Thynnus brachypterus; Balearic Isles, Vindobonæ). Tasch., 1879, 250 (syn. of Hexacotyle thynni (Delaroche)).

thynni (Delaroche, 1811) Braun, 1891d, 421.

PLAGIOPORUS Staff., 1904, May 3, 493–494 (m. serotinus); πλάγιος, oblique; πόρος, pore.

serotinus Staff., 1904, May 3, 493–494 (in Moxostoma macrolepidotum L. S.; Canada).

PLAGIORCHIDÆ Luehe, 1901, 173; 1901, 486, 487.—Looss, 1902m, 839, 840 (includes: Lepodermatinæ Looss, Brachycœliinæ Looss, Pleurogenetinæ Looss, also Prymnoprion, Haplometra, Pneumonœces (=Hæmatolœchus), Saphedera (=Macrodera), Opisthogonimus Luehe, Anchitrema, Dist. mutabile, Dicrocœliinæ).

PLAGIORCHIINÆ Pratt, 1902, 888, 898 (includes: Opisthioglyphe, Plagiorchis; related genera: Glossidium, Enodiotrema, Pachypsolus).

PLAGIORCHINÆ Luehe, 1901, 173.

PLAGIORCHIS Luehe, 1899k, 531, 532, 533, 534 (tld. D. lima); 1900, 558; 1901, 487 (lima designated type).—Braun, 1901b, 56, 58; 1901i, 56, 58; 1901, 563, 564, 567, 568; 1902b, 37, 40, 41, 42, 43, 46, 47, 49, 50, 53, 54, 94, 125 (syn. Lepoderma Looss, 1899).—Looss, 1900, 607; 1901b, 207; 1902m, 813, 824; 1907, Mar. 5, 483.—Pratt, 1902a, 888, 899.—Staff., 1905, Apr. 11, 691.—Stoss., 1904, Feb. 11, 1-2, 1 pl., 1 fig.; 1905, 31 Jan., 24.—(See also Dist. cirratum, D. lima, mentulatum, and probably D. erraticum, D. ramlianum, D. reniforme (=unicum[=renifera]), D. horridum Leidy, possibly didelphydis).

asperus Stoss., 1904, 1-2, 1 pl., 1 fig. (in intest. ten. of Plecotus auritus; Grisignana, Istria).

cirratus (Rud., 1802) Luehe, 1899, 530.—Braun, 1901, 564, 566; 1902b, 43, 46, 47, 50 (syns.: Fasc. cirrhata Rud., 1802, 66; Dist. cirr. Rud., 1809a, 376; 1819a, 100; Dies., 1850a, 350; Mueh., 1896, 262; Dist. (Brachylaimus) cirratum Duj., 1845a, 413; Stoss., 1892, 11).—Staff., 1905, Apr. 11, 693.

didelphidis (Par., 1896) Stoss., 1904, table (in Didelphis marsupialis; Paraguay).

elegans (Rud., 1802) Braun, 1902b, 38, 42, 43, 46, 47, 50 (syns.: Fasc. elegans Rud., 1802, 65; Dist. elegans Rud., 1809a, 375; 1819a, 100; Crep., 1829, 59; Dies., 1850a, 349; Dist. (Brachylaimus) elegans Stoss., 1892, 11, as syn. of D. cirratum; Duj., 1845a, 414; D. erraticum Linst., 1894, 335; D. elegans Rud. =D. cirratum Rud., Mueh., 1896; 589).—Stoss., 1904, table (in Uccelli insettivori diversi; Europe).

horridus (Leidy, 1850) Stoss., 1904, table (in Boa, India; Python, America).

[*lima* (Rud., 1809) Luehe, 1899k, 930-931.]

maculosus (Rud., 1802) Braun, 1901, 943; 1902b, 45, 46, 47, 54, 93, 94, figs. 27, 28 (syns.: Fasc. hirundinis Frœlich?, 1791, 75; Dist. hirundinis Zed.?, 1800a, 169; Fasc. masculosa Rud., 1802, 67; Dist. maculosum Rud., 1809a, 374; Duj., 1845a, 412; Dies., 1850a, 349; D. maculosum =P. maculosum Braun, 1901, 566; D. (Dicrocœlium) maculosum Olss., 1876, 14; D. (Brachylaimus) maculosum Stoss., 1892, 11; D. crassum Olss., 1876, 25 nec Siebold).—Kowal., 1902d, 27 [9] (maculosa); 1904, 25 [10] (in Hirundo rustica; Dublany).

mentulatus (Rud., 1819) Stoss., 1904, table (in Tropidonotus, Lacerta, Podarcis; Europe).

nanus (Rud., 1802) Braun, 1901, 567; 1902b, 47, 50, figs. 29, 30 (syns.: Fasc. nana Rud., 1802, 68; Dist. nanum Rud., 1809a, 376; 1819a, 101; Duj., 1845a, 446; Dies., 1850a, 350; Stoss., 1892, 41).—Stoss., 1904, table (in Glareola, Scolopax: Greifswald).

permixtus Braun, 1901, 943 (in Hirundo rustica; Coll. Vienna); 1902b, 46, 54, figs. 33, 34.—Stoss., 1904, table (in rondine; Vienna).

ramlianus (Looss, 1896) Stoss., 1904, table (in Cameleonte; Egitto).—Type of Lepoderma, 1899.

sauromates (Poir., 1886) Stoss., 1904, table (in Elaphis).

triangularis (Dies., 1850) Braun, 1901, 568; 1902b, 51, figs. 32, 33 (syns: Dist. triangulare Dies., 1850a, 351; Stoss., 1892, 44; D. (Brachylaimus) meropis Par., 1896, 5; Megacetes triangularis Looss, 1899, 725).—Stoss., 1904, table (in Merops apiaster; Vienna).

vespertilionis (Mueller, 1784) Braun, 1900, 217-220, 228, 230, pl. 10, figs. 1-2.—Staff., 1905, April 11, 693 (syn. Dist. lima; in Vespertilio subtilis Say; Canada).—Stoss., 1904, 1, table (in Chirotteri diversi; Europa centrale).

vitellatus (Linst., 1875) Braun, 1901, 943 (in Actitis hypoleucus); 1902b, 50, 51, fig. 31 (syns. Dist. vitellatum Linst., 1875, 189; D. (Brachylaimus) vitellatum Stoss., 1892, 12).—Stoss., 1904, table (in Actitis hypoleucus; Ratzeburg).

PLANARIA Mueller, 1776 (worm); 1780, 210; Gœze, 1782a (trematode); Brown, 1827 (mollusk); Lea, 1833 (mollusk). [The early literature on Planaria is rather confused, containing references to turbellaria, trematodes, and mollusks. The name is now confined to the fresh-water turbellarian group Pla-

PLANARIA—Continued.

nariidæ. The list of species given below contains all the specific (trematode and others) names which we have thus far had occasion to index. We have not worked out the type species, except for Gœze, 1782.]

—— of Braun. —— Dies., 1850a, 412 (syn. of Polyst.).—Tasch., 1879, 251 (syn. of Polyst.).

—— of Gœze, 1782a, 41, 168–179, a genus or "Geschlecht" containing among others Fasc. hepatica, hence takes this as type; Gœze divides Planaria into 4 "Gattungen": Latiuscula, Teres seu Cylindrica, Alata seu Dubia, Subclavata.—Abildg., 1790a, 36 (syn. of Dist.); 1794, 58.—Brand., 1888a, 8.—Braun, 1893a, 883, 884, 893, 894, 902, 908.—Crep., 1837, 309.—Dies., 1850a, 307 (syn. of Hemist.), 312 (syn. of Holost.), 318 (syn. of Diplodiscus), 331 (of authors, syn. of Dist.), 388 (of Gœze, 1782a, 177, pl. 16, syn. of Dist. ferox).—Lamouroux, 1824a, 559 (syn. of Dist.).—Nitzsch, 1819, 397.—Rafinesque, 1815, 151 (syn. of Monostomeus Raf.).—Rud., 1809a, 22.—Stiles, 1901, 180.—Stiles & Hass., 1898a, 88, 92 (syn. of Fasc.).

—— of Linn.—Bosc, 1802a, v. 1, 248–254.

—— fresh water.—Knapper, 1865a, 39 pp., 2 pls.; 1866a, 271–272.

—— land.—Kennel, 1878a, 26–29 (Dorpat).—Mosley, 1874, 132 (Ceylon).

—— marine.—Collinwood, 1876a, 83–98, pls. 17–19 (31 species).—Gœtte, 1878a, 75–76.—Keferstein, 1869a, 3–38, pls. 1–3 (St. Malo).—Kirk, 1882, 267–268.—Monti, 1900, 1–16, 2 pls. (regeneration).—Quatrefages, 1845, 129–184.

—— miscellaneous.—Agassiz, 1866, 306–309.—Baer, 1826a, 126; 1827b, 1828d, 183–187 (of Dugès).—Bardeen, 1902, 262–288, 12 figs. (embryology, regenerative development); 1903, 1–20, 18 figs. (heteromorphosis).—Bory de St. Vincent, 1828b, 11.—Calkins, 1901b, 12 (of Agassiz).—Curtis, 1905, July 4, 169–175, 2 figs. (location of pharynx in embryo); 1905, 855–856.—Cuvier, 1817, 43.—Dalyell, 1814a.—Dugès, 1828a, 139–183, pls. 4–5 (planariées); 1830a, 169–183; 1830b, 72–90, figs. 1–26; 1833b, 619–625, figs. 1–26.—Fabricius, 1794, 20; (1798a), 52–66, pl. 2.—Faraday, 1832a, 723–724; 1833a, 183–185; 1834a, 994.—Fischer, 1799, 96.—Geddes, 1880a, 51–58; 1880b, 99–100.—Gerstfeldt, 1859a, 261–263.—Girard, 1850a, 398–402; 1850b, 300–308; 1851a; 1851b; 1854a (from Carolina).—Graber, 1879a, 278 (ameboid epithelium).—Grube, 1872a, 273–292, pls. 11–12 (from Baikal).—Herbst, 1787a, 33, 36, 94.—Houghton, 1867a, 300–301 (n. sp.); 1870a, 255–257, figs. 1–2 (2 sp. from Borneo).—Hoyle, 1890, 49.—Johnson, 1822a, 437–447, figs. 1–17; 1825b, 247–256, pl. 16, figs. 1–11; 1833b, 177–178; 1883c, 238.—Kœlliker, 1846a, 291–295, figs. 1–13.—Lamarck, 1801a, 330.—Lankester, 1890, 835–836.—Lawson, 1861a; 1861b.—Leidy, 1847e, 252 (2 sp.); 1848a, 78–79.—Leuck., 1863, 154.—Morgan, 1904, 502–505.—Pallas, 1781a, 59.—Rathke, 1799, 82; 1799, 147, pl. 2, figs. 7–8.—Ryder, 1882, 48–51, figs. 1–10 (parasitic on Limulus).—Sabussow, 1904, 1–28.—Schneider, 1866, 11.—Slawikowski, 1819, 56.—Thienemann, 1906, 499–504.

alata Gœze, 1782a, 176 177, pl. 14, figs. 11–13 (t. h. the fox).—Brand., 1888a, 60 (to Hemist.).—Dies., 1850a, 307–308 (to Hemist.).—Nitzsch, 1819, 399 (to Holost.).—Rud., 1809a, 402 (to Dist.).—Ward, 1895, 341 (to Hemist; in Canis familiaris).

alpina (Dana).—Collin, 1891b, 177–180; 1891c, 177–180.—Borelli, 1905, 4 pp.—Brand., 1900, 303–304.—Fredericq, 1905, 199–200; 1905 (X, 18), 597 (in Belgium).

angulata (Mueller, 1774) Fabricius, 1798, 53–58, pl. 11, figs. 1–7.—Bosc, 1802a, v. 1, 256.—Herbst, 1787a, 34.

ardeæ (Gmelin, 1790) Rud., 1809a, 432 (see Dist. ardeæ stellaris Rud.).

atomata Bosc, 1802a, v. 1, 260.

auriculata Bosc, 1802a, v. 1, 261.

badia Rathke, 1799, 147, pl. 3, figs. 9, a–b.

bicornis Bosc, 1802a, v. 1, 257.

bilis Braun, 1790a, 61, pl. 3, figs. 4–5 (in Falco melanaëtus; Germany); 1792, 61, pl. 3, figs. 4–5—Braun, 1901f, 561.—Dies., 1850a, 376 (syn. of Dist. crassiusculum).—Gmelin, 1790a, 3054 (to Fasc.).—Rud., 1809a, 408 (=Dist. crassiusculum Rud.).

brunnea (Mueller, 1774) — —, 1776.—Fabricius, 1798, 64–66, pl. 11, figs. 13–15.—Bosc, 1802a, v. 1, 255 (brunea).—Herbst, 1787a, 33.

PLANARIA—Continued.

candida (Mueller, 1774) — —, 1776.—Fabricius, 1798, 62-64, pl. 11, figs. 11-12.—Bosc, 1802a, v. 1, 262.—Herbst, 1787a, 35.

capitala Bosc, 1802a, v. 1, 261 (for capitata?), in Baltic Sea.

capitata (Mueller, 1774) — —, 1776.—Herbst, 1787a, 35.

carnea Rathke, 1799, 83, 147, pl. 3, figs. 10 a-b.

caudata (Mueller, 1774) Bosc, 1802a, v. 1, 261.—Herbst, 1787a, 35.

cavatica Fries, — —, 151-153.

ciliata (Mueller, 1774) — —, 1776.—Bosc, 1802a, v. 1, 255.—Herbst, 1787a, 34.

cornuta Mueller, 1776a, 221.—Bosc, 1802a, v. 1, 260.—Herbst, 1787a, 34.

crenata (Mueller, 1774) — —, 1776.—Bosc, 1802a, v. 1, 259.—Herbst, 1787a, 34.

cylindrica Gœze, 1782, 173: P. teres s. cylindrica, 174 (syn. of cylindraceum) (in frogs).—Dies., 1850a, 368 (syn. of Dist. cylindraceum).—Looss, 1894a, 64 (syn. of Dist. cylindraceum).—Rud., 1809a, 393.

dubia Gœze, 1782a, 177 (=P. alata).

ehrenbergii Focke, 1836a, 191-206, pl. 17, figs. 1-19.

festæ Borelli, 1898, 6 pp., 2 figs., var. albolineata.

filaria Bosc, 1802a, v. 1, 261.

flaccida (Mueller, 1774) — —, 1776.—Bosc, 1802a, v. 1, 256.—Herbst, 1787a, 34.

fulva Bosc, 1802a, v. 1, 257-258.

fusca Fabricius, 1798, 58 (syn. Fasc. angulata Mueller); 1799, 151.—Bosc, 1802a, v. 1, 258.

fuscescens Fabricius, 1798, 58-62, pl. 11, figs. 8-10; 1799, 151.

gessercnsis Bosc, 1802a, v. 1, 262.

glauca (Mueller, 1774) Herbst, 1787a, 43.—Bosc, 1802a, v. 1, 258.

gonocephala Ackermann, 1905, 137-139, 4 figs.

grisea Bosc, 1802a, v. 1, 257.

grossa (Mueller, 1774) — —, 1776.—Bosc, 1802a, v. 1, 260.—Herbst, 1787a, v. 1, 35.

gulo (Mueller, 1774) — —, 1776.—Bosc, 1802a, v. 1, 255.—Herbst, 1787a, 34.

helluo (Mueller, 1774) Herbst, 1787a, 35.—Bosc, 1802a, v. 1, 259.

hirudo Johnston, 1846a, 437, pl. 15, fig. 3.—Dies., 1850a, 473.

ignorata Raspail, 1902, 119-123.

inquilina Graff, 1904, 457 (in Schnecken).

insignis Graff, 1904, 457 (in Schnecken).

intestinalis Mueller.—Abildg., 1790, 34 (syn. of Fasc.).

lactea (Mueller, 1774) Herbst, 1787a, 34.—Baer, 1826a, 126.—Bosc, 1802a, v.1, 258-259.—Nord., 1832a, 69.—Tasch., 1879, 36.

lagena Braun, 1788a, 257, pl. 10, figs. 1-3.—Dies., 1850a, 380 (syn. of Dist. nodulosum).—Gmelin, 1790a, 3057 (to Fasc.).—Looss, 1894a, 33 (syn. of D. nod.).—Rud., 1809a, 410, 412 (syn. of D. nod.).

latiuscula Gœze, 1782a, 169, 171.—Anacker, 1892c, 94.—Dies., 1850a, 333 (syn. of Dist. lanceolatum), 385 (syn. of D. echinocephalum Rud.).—Dunglison, 1893, 875.—Macé, 1882, 25.—Rud., 1809a, 353 (=Fasc. hepatica), 429 (=Dist. falconis milvi Rud.).—Stiles & Hass., 1898a, 88.—Stiles, 1898a, 29.—Ward, 1895, 246 (syn. of Fasc. hep.).

laurentiana Borelli, 1897, 4 pp., 1 fig.

limuli Graff (1879), 202-205.

linearis (Mueller, 1774) Herbst, 1787a, 35.—Bosc, 1802a, v. 1, 260.—Rathke, 1799, 83, 147, pl. 3, fig. 11.

lineata (Mueller, 1774) — —, 1776.—Bosc, 1802a, v. 1, 258.—Herbst, 1787a, 34.

lingua Bosc, 1802a, v. 1, 262.

littoralis Herbst, 1787a, 35.

lucii (Mueller, 1776) Gœze, 1782a, 172, pl. 14, fig. 3.—Ben., 1858a, 1861a, 100 (syn. of D. teret.).—Dies., 1850a, 358 (syn. of Dist. tereticolle).—Looss, 1894a, 5 (syn. of D. teret.).—Rud., 1809a, 380.—Sramek, 1901, 105 (syn. of D. teret.).

lugubris Morgan, 1901, 179-212, 14 figs; 1902, 132-139, 24 figs.

PLANARIA—Continued.

maculata Leidy, 1847e, 252; 1851b (free; Philadelphia); 1904a, 11, 54 (maculta).—Bardeen, 1901, 351–352 (regeneration).—Curtis, 1900, 56–59, 9 figs. (anat., development of reproductive organs); 1901, 357–359 (asexual reprod.); 1902, 515–559, 11 pls. (biol., reprod. organs).—Morgan, 1898–1900, 364–397, 41 figs.; 1904, 683–695, 1 fig.—Thacher, 1902, v. 36, 633–641; 1903, 24 Feb., 115–116.

maculta Leidy, 1904a, 54, for maculata.

marmorata Bosc, 1802a, v. 1, 262 (free form).

marmorosa (Mueller, 1774) Herbst, 1787a, 35.

melis [Gœze, 1782a, 176, pl. 14, figs. 9–10, Planaria in Dachs, March].—Dies., 1850a, 381 (syn. of Dist. trigonocephalum).—Rud., 1809a, 415.

midæ (=*mydæ* renamed?) Dies., 1850a, 325 (syn. of Monost. trigonocephalum).—Braun, 1901b, 42.

montenigrina Mrazek, 1904a, 43 pp., 2 pls., 2 figs.; Montenegro.

mutabilis Eichwald, ——, 78, pl. 9, fig. 16.—Dies., 1850a, 649.

mydæ Braun in Rud., 1809a, 336 (=Monost. (Monost.) trigonocephalum Rud., 1809).

nigra (Mueller, 1774) Herbst, 1787a, 33.—Bosc, 1802a, v. 1, 255.—Chiaje, 1837a, 14.

notulata Bosc, 1802a, v. 1, 254–255, pl. 8, figs. 7–8.

obscura (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 259.—Herbst, 1787a, 35.

operculata Herbst, 1787a, 36.—Bosc, 1802a, v. 1, 256.

polychroa Tasch., 1879, 36.

punctata (Mueller, 1774) Herbst, 1787a, 34 [6], 35.—Bosc, 1802a, v. 1, 255.

pusilla Braun, 1790a, 63–65, pl. 3, figs. 6–7 (in Erinaceus europæus; Europe).—Dies., 1850a, 360 (to Dist.).—Gmelin, 1790a, 3055 (to Fasc.).—Rudolphi, 1809a, 384.

pusio Eichwald, ——, 79, pl. 9, fig. 17.—Dies., 1850a, 648.

putorii Gmelin, 1790a, 3053.—Dies., 1850a, 381 (syn. of Dist. trigonocephalum).—[Gœze, 1782a, 175, pl. 14, figs. 7–8].—Nord., 1840, 621 (syn. of Fasc. trigonocephala).—Rud., 1809a, 415.

quadrangulata Bosc, 1802a, v. 1, 257.

radiata (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 260.—Herbst, 1787a, 35.

rosea (Mueller, 1774) Herbst, 1787a, 34.—Bosc, 1802a, v. 1, 256.—Lamarck, 1801a, 330.

rostrata (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 259.—Herbst, 1787a, 35.

rubra (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 256.—Herbst, 1787a, 34.

rutilans Bosc, 1802a, v. 1, 258.

schlosseri Graff, 1904, 457 (in Botryllus schlosseri).

simplicissima Morgan, 1904, 385–393, 20 figs.—Stevens, 1904, 208–220, 4 pls.

simplissima Curtis, 1900a, 10 Apr., 447–466, pls. 31–32, figs. 1–14 (reproductive system); 1900b.

stagnalis (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 255.—Herbst, 1787a, 33.

striata Herbst, 1787a, 34.

strigata (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 260.—Herbst, 1787a, 35.

strigis (Schrank, 1788).—Fischder., 1901, 367; 1902a, 7 (=Holost. macrocephalum), type of Strigea; 1903h, 490.

subclavata Gœze, 1782a, 178–179, pl. 15, figs. 2–3 (t. h. Rana, intestine; Europe) (restricted from Fasc. subclavata, ore sessile, Pallas).—Ben., 1858a, 1861a, 81, 82 (to Amphist.).—Dies., 1850a, 318 (to Diplodiscus).—Nitzsch, 1819, 398 (to Amphist.).—Nord., 1840, 627 (to Amphist.).—Olfers, 1816, 45.—Rud., 1809a, 348 (to Amphist.).

subulata Herbst, 1787a, 36.—Bosc, 1802a, v. 1, 257.

tentaculata (Mueller, 1774) ——, 1776.—Baer, 1826a, 126.—Bosc, 1802a, v. 1, 259.—Herbst, 1787a, 34.

teres seu *cylindrica* Gœze, 1782a, 173.—Linst., 1905, 191.—Looss, 1899b, 680.

teres duplici poro Gœze, 1782a, 173.—Baird, 1853a, 55 (=Dist. trigonocephalum).

PLANARIA—Continued.

teres poro simplici Gœze, 1782a, 173, 174, pl. 14, figs. 4-6.—Baird, 1853a, 47, 55 (=Holost. macrocephalum).—Dies., 1850a, 312 (syn. of Holost. variabile), 383 (syn. of D. echinatum).—Rud., 1809a, 340, 418.

terrestris (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 261.—Carrière, 1879a, 29 Dec., 668.—Herbst, 1787a, 35.—Jenyns, 1869a, 25.—Lubbock, 1868a, 193-195 (in England).

tetragona (Mueller, 1774) ——, 1776.—Bosc, 1802a, v. 1, 261.—Herbst, 1787a, 35.—Mueller, ——, v. 3, 42 (=Fasc. tetragona) (free form).

torva (Mueller, 1774) Herbst, 1787a, 34.—Baer, 1826a, 126.—Ben., 1858a, 1861a, 198.—Bosc, 1802a, v. 1, 259, pl. 8, fig. 9.—Flexner, 1898, 337-346, 1 pl. (regeneration of nervous syst.).—Mont., 1888a, 44.

tremellaris (Mueller, 1774) ——, 1776.—Herbst, 1787a, 35.

trimellaris Bosc, 1802a, v. 1, 262.

truncata Bosc, 1802a, v. 1, 262.

truncata Leidy, 1851 (free form; Newark, Del.); 1904a, 54.

uncinulata Braun, 1790a, 58-61, pl. 3, figs. 1-3 (in Rana esculenta; Germany).—Dies., 1850a, 412 (syn. of Polyst. integerrimum).—Gmelin, 1790a, 3056 (to Fasc.).—Rud., 1809a, 451.—Stoss., 1898, 10.

unionicola Graff, 1904, 457 (in Muscheln).

velellæ Graff, 1904, 456.

ventricosa Bosc, 1802a, v. 1, 257.

vespertilionis (Mueller, 1784).—Dies., 1850a, 387 (of Gœze, 1782a, 171, pl. 14, f. 1-2, syn. of Distomum lima).—Kolenati, 1857, 12.—Rud., 1809a, 427.

viridata Bosc, 1802a, v. 1, 258.

viridis Bosc, 1802a, v. 1, 256.—Herbst, 1787a, 34.

PLANARIADÆ Mell, 1903, 191-236, 3 pls., 4 figs. (of madagassischen Subregion).

PLANARIÆ Fabricius, 1799, 151.—Blainv., 1828a, 577 (fam.).—Darwin, 1844a, 14 Oct., 241-251, pl. 5, figs. 1-4.—Faraday, 1832a, 11 Feb., 723-724; 1833a, Jan., 183-185; 1834a, 994.—de Férussac, 1821a, 90-92, pl. 116 (sp. in Brazil).—Girard, 1850a, 398-402 (embryology); 1851a, 258-273; 1851b, Jan., 41-53.—Houghton, 1870a, Sept., 255-257, figs. 1-2 (from Borneo).

PLANARIIDÆ Pease, 1860, 37-38 (of Sandwich Islands).

PLATYASPIS Mont., 1892, Oct. 7, 205 (m. lenoiri).—Braun, 1893a, 888, 890, 891, 894, 896, 897, 917; 1893b, 188.—Gamb., 1896a, 73.—Kofoid, 1899a, 181, 182, 183, 184.—Looss, 1902m, 428, 429.—Nickerson, 1902, 613, 615.—Pratt, 1902, 887, 891.—Stoss., 1899, 4.

anodontæ Osborn, 1898, 416 (in Unio luteolus, Anodonta; Lake Chautauqua, N. Y.).—Kofoid, 1899a, 179-186 (identity with Cotylaspis insignis); 1899b.

lenoiri (Poir., 1886) Mont., 1892, Oct. 7, 205-206 (in Tetrathyra vaillanti; Senegal).—Braun, 1893a, 897.—Looss, 1902m, 418, 428, 429, 783.—Nickerson, 1902, 613.

PLATYCOTYLE Ben. & Hesse, 1863; 1864, 96, 108 (m. gurnardi).—Braun, 1890a, 413, 498, 516, 517, 523, 534, 537, 546; 1893a, 890.—Cerf., 1895h, 918; 1896, 514.—Gamb., 1896a, 73.—Hoyle, 1890, 539.—Mont., 1888a, 8, 11, 86, 89, 100.—Pratt, 1900, 646, 651, 656, fig. 27.—Tasch., 1879, 69; 1879, 239, 248.

guanardi Tasch., 1879, 248, for gurnardi.

gurnardi Ben. & Hesse, 1863, 108; 1864, 108-109, pl. 11, figs. 14-15 (in Trigla gurnardus).—Braun, 1890a, 418; 469, 537, 548, 552.—Pratt, 1900, 656, 657, fig. 27.—Tasch., 1879, 248 (guanardi, in Trigla gu[r]nardus).

PLECTANOCOTYLE Dies., 1850a, 289, 420-421, 425 (m. elliptica).—Braun, 1890a, 413, 415, 516, 517, 523, 534, 537, 546; 1893a, 890.—Gamb., 1896a, 73.—Goldb., 1855, 19.—Hoyle, 1890, 539 (on gills of Labrax mucronatus).—Mont., 1888a, 11, 89, 100; 1892, Oct. 7, 213 (Octocotylinæ); 1899c, 1045-1053, figs. 1-12; 1903, 336 (subf. Plectanocotylinæ); 1905, 76-78.—Pratt, 1900, 646, 651, 656, fig. 30; 661 (on gills of marine fishes).—Tasch., 1879, 69 (of Ben. & Hesse); 1879, 239, 250 (syn. Plectanophorus).

1858: Plectanophorus Dies., 1858, 315, 382 (m. ellipticus).

PLECTANOCOTYLE—Continued.

elliptica Dies., 1850a, 421 (t. h. Labrax mucronatus; loc. not given); 18—, 69, pl. 1, figs. 4–9; 1858e, 382 (to Plectanophorus).—Braun, 1890a, 408, 537, 548, 551.—Mont., 1905, 76.—Pratt, 1900, 656, fig. 30; 657, 661.—Tasch., 1879, 250 (in Labrax mucronatus).

lorenzii Mont., 1899, 1, 1 pl.; 1899c, 1045–1053, figs. 1–12 (on Trigla sp.; Rovigno); 1905, 76, 78.—Scott, 1905, 116 (syn. Phyllocotyle gurnardi) (in Trigla sp.).

nordmanni (Dies., 1850) Braun, 1890a, 418.—Type of Encotyllabe.

PLECTANOCOTYLINÆ Mont., 1903, 336 (f. Hexacotylidæ).

PLECTANOPHORA Dies., 1858.—Ben. & Hesse, 1864, 120.—Mont., 1888a, 84.

PLECTANOPHORUS Dies., 1858e, 315, 382 (m. ellipticus; Plectanocotyle renamed); 1859c, 443.—Tasch., 1879, 250 (syn. of Plectanocotyle Dies.).

ellipticus (Dies., 1850) Dies., 1858e, 382 (in Labrax mucronatus), type of Plectanocotyle 1850.—Tasch., 1879, 250 (to Plectanocotyle).

PLECTOBOTHRII Nord., 1840, 596.

PLEORCHIS Rail., 1896, Mar. 15, 160 (for Polyorchis Stoss., 1892 [not Agassiz, 1862, cœlenterate]; type polyorchis).—Pratt, 1902, 887 (related to Fasciolinæ), 893.—Stiles & Hass., 1898a, 92, 97 (syns.: Dist. (Polyorchis) Stoss., Polyorchis Stoss.) (type polyorchis).—Stoss., 1898, 30.

cygnoides (Zed., 1800) Stoss., 1898, 31 (in Bombinator igneus; Triest).

mollis (Leidy, 1856) Stiles, 1896, 213.

polyorchis (Stoss., 1889) Stiles, 1896, 205.—Stoss., 1898, 30–31 (in Corvina nigra; Triest).

urocotyle Par., 1899, 6, 1 fig. (in Scorpæna scrofa; Portoferrajo); 1902, 5 (in Scorpæna porcus; Portoferrajo; S. scrofa; Elba).—Braun, 1902b, 23.—Odhn., 1905, 364.

PLESIOCHORUS Looss, 1901b, 205 (m. cymbiformis); *ὁ πλησιόχωρος*, Grenznachbar; 1901, 557, 558; 1902m, 478, 479, 480, 481, 482, 483, 484, 485, 526, 814, 844, 857 (Anaporrhutinæ), 858, 859, 860, 861, 863, fig. iv.—Odhn., 1901, 65, 67; 1902, 65, 67.—Pratt, 1902, 888, 901.

cymbiformis (Rud., 1819) Looss, 1901b, [205], 207, 209; 1901, 557, 558; 1902m, 414, 415, 417, 469–476 (includes Dist. cymbiformis Rud., 1819, 371; Sons., 1893, 2; Stoss., 1895, 38, pl. 4, fig. 1; Braun, 1899, 729; Looss, 1899b, 605; Phyllodist. cymbiforme (Rud.) Braun, 1901, 1, pl. 1, fig. 1), 479, 480, 782, 788, 791 (amphitypie very common), 813, 814, 844, 857, 863, 870, pl. 23, figs. 30–36.—Odhn., 1902, 68.—Reported for Chelone mydas, Thalassochelys corticata.

PLEUROCOTYLE [a] Gerv. & Ben., 1859b, 194 (based upon Grube, 1855a, 137) (m. scombri).—Ben. & Hesse, 1864, 96.—Brand., 1898a, [17] 209.—Braun, 1890a, 413, 414, 462, 477, 516, 517, 523, 534, 535, 546; 1893a, 890.—Cerf., 1895h, 918; 1896, 514.—Dies., 1859c, 444 (syn. of Grubea Dies.).—Gamb., 1896, 73.—Hoyle, 1890, 539.—Mont., 1888a, 8, 11, 48, 84, 89, 99; 1892, Oct. 7, 213 (subg. in Octocotylinæ); 1903, 336 (Pleurocotylinæ).—Pratt, 1900, 646, 651, 656, fig. 28.—Tasch., 1879, 69; 1879, 239, 248 (syns.: Octobothrium ? Grube, Tetracotyle Grube, Grubea Dies.).—Ziegler, 1883, 552.—See Grubea.

scombri (of Grube, 1855) [Gerv. & Ben., 1859b, 194, does not use combination, based on Troschel's Arch., 1855, 137].—Ben. & Hesse, 1863, 100; 1864, 100 (syns.: Octobothrium scombri Grube, Grubea scombri) (in Maquereau).—Braun, 1890a, 407, 414, 418, 462, 518, 535, 548, 552.—Knoch, 1894a, 11, 12.—Lang, 1880.—Mont., 1888a, 48, 49.—Par., 1894, 549, 595, 671, 680; 1902, 3 (in Scomber colias, S. scomber, S. sp.; Portoferrajo).—Par. & Perugia, 1890, 7.—Pratt, 1900, 656, 657, fig. 28.—Scott, 1901, 147.—Tasch., 1878, 575–577; 1879, 35; 1879, 248–249 (syns.: Octobothrium sc. Nord., Tetracotyle sc. Grube, Grubea cochlear Dies.) (in Scomber scombrus, S. colias; Naples).

PLEUROCOTYLIDÆ Mont., 1903, 336 (subf. Pleurocotylinæ, g. Pleurocotyle).

PLEUROCOTYLINÆ Mont., 1903, 336 (f. Pleurocotylidæ).

PLEUROGENES Looss, 1896b, 97 (tod. claviger) (*πλεῦρα*=side; *γενάω*=procreate); 1899b, 614, 615, 616–617, 622, 623; 1901, 194; 1902m, 820, 838.—Luehe, 1899, 536; 1900, 509.—Pratt, 1902, 889, 902.—Staff., 1905, Apr. 11, 683, 684.—Stiles, 1901, [183] (Pleuronectes, lapsus calami), 185.—Stoss., 1899, 7, 10.

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[a] Gervais & Ben. use both Pleurocotyle and Pleurocotylus, but they evidently intended the former as a French vernacular name, the latter as the Latin scientific ie. Later authors apparently overlooked this fact.

PLEUROGENES—Continued.

arcanum (Nickerson, 1900) Pratt, 1902, 959.—Klein, 1905, 13 (arcana); 1905, 71 (arcanus).—Staff., 1905, 683 (type of Loxogenes).

betencourti (Mont., 1893) Stoss., 1899, 10 (in Scyllium canicula, S. stellare; Boulogne).—Looss, 1899b, 622.

brusinæ (Stoss., 1889, 25) Stoss., 1899, 10 (in Oblata melanura; Triest).—Looss, 1899, 622.—Type of Diphtherostomum, 1904.

claviger (Rud., 1819) Looss, 1899b, 569, 617; 1902m, 787, 820.—Klein, 1905, 11, 13, 17; 1905, 69.—Kowal., 1902d, [9] 27 (syns.: Dist. cl. Rud., D. neglectum Linst.); 1904, [7] 22.—Luehe, 1901, 171; 1901, 57.—Odhn., 1900, 17.—Ssinitzin, 1905, 146.—Staff., 1905, Apr. 11, 684 (type).

confusus (Looss, 1894) Klein, 1905, 68; 1905, 10, 11, 12, 13, 17.

gastroporus Luehe, 1901p, 166–171 (in Rana cyanophlyctis Schneider; India).—Klein, 1905, 10, 11, 13, 14; 1905, 68, 69.—Staff., 1905, Apr. 11, 684.

glaviger Ssinitzin, 1906, 687 (for claviger).

medians (Olss., 1876) Klein, 1905, 10, 11, 12, 13, 14, 17, 18; 1905, 68.—Looss, 1899b, 617; 1902m, 820, 824.—Luehe, 1901, 57; 1901, 171.—Odhn., 1900, 17.—Ssinitzin, 1905, 145–146; 1906, 687 (in Agrion and beetle larvæ; Warschau). Staff., 1905, Apr. 11, 683 (syn. of Loxogenes arcanum), 684, 685.—Stoss., 1900, 7–8, fig. 12 (in Rana esculenta; Triest); 1900, 17.

sphæricus Klein, 1905, 68–72, pl. 5, figs. 4–5 (in Rana hexadactyla; Kœnigsberg, from India); 1905, 10–14, pl. 1, fig. 5.

tacapense ("Sons., 1894" of Looss, 1896) Stoss., 1899, 10 (= Prosotocus tener [tacapense was a misdetermination]) (in camaleonte; Tunisia; Alessandria).

tacapensis (Sons., 1894) Looss, 1899b, 622.

tener (Looss, 1898) Looss, 1898, 461; 1899b, 622.—Klein, 1905, 10, 11, 12, 13; 1905, 68.

PLEUROGENETINÆ Looss, 1899b, 615, 623; 1902m, 839.—Luehe, 1900, 561; 1901, 171.—Odhn., 1902, 38, 42; 1902, 40.—Pratt, 1902, 889, 902 (includes: Prosotocus, Pleurogenes, Gymnophallus, Lepidophyllum).—Stoss., 1904, 198.—Ward, 1901, 185.

PLEUROGONINÆ Braun, 1900a, 1664, 1674.

PLEUROGONIUS Looss, 1901l, 567, 568, 569 (tod. longiusculus); 1902m, 417, 557, 564, 569, 570 (type longiusculus), 572, 579, 583, 588, 589, 591, 594, 595, 596, 597, 599, 603, 609, 610, 612–616.—Pratt, 1902, 890, 910.

bilobus Looss, 1901l, 569 (in Chelone mydas; Egypt); 1902m, 567–568, pl. 27, fig. 100; 569, 878, pl. 27, fig. 100.

linearis Looss, 1901l, 618 (in Chelone mydas; Egypt); 1902m, 565–567, 569, 878, pl. 27, fig. 99.

longiusculns Looss, 1902m, 582, misprint.

longiusculus Looss, 1901l, 568–569, 618 (in Chelone mydas; Egypt) (582 longiusculns); 1902m, 527, 558–561 (syn. Monost. trigonocephalum R. of Ben., 1859, 81, pl. 2, fig. 5; Walter, 1893, 191), pl. 27, figs. 94–98, pl. 32, figs. 176, 177; 562, 563, 564, 565, 566, 569, 570 (type of Pleurogonius), 588, 589, 591, 592, 596, 617, 788.

minutissimus Looss, 1901l, 7 Nov., 618–619 (in Chelone mydas; Egypt); 1902m, 568–569, pl. 27, fig. 101; 879.

trigonocephalus (Rud., 1809) Looss, 1901l, 567–568, 620 (in Thalassochelys corticata); 1902m, 416, 417, 548–558 (syns.: Monost. trigonocephalum Rud., 1809a, 336; 1819a, 349; Braun, 1901a, 38, pl. 2, fig. 29), pl. 26, figs. 75–78; 569, 570, 575, 588, 813, 876.—Cohn, 1904, 237.

PLEURONECTES Stiles, 1901, 183, lapsus calami for Pleurogenes.

PNEUMONŒCES Looss, 1902m, 732, 780, 839 (Hæmatolœchus Looss renamed) (type variegatus).—Klein, 1905, 64.—Staff., 1905, Apr. 11, 687 (syn. Hæmatolœchus).

1899: Hæmatolœchus Looss, 1899b, 600 (tod. variegatus) [not Hæmatolœcha Stål, 1874, hemipteron].

asper (Looss, 1899) Klein, 1905, 64; 1905, 6.

breviplexus (Staff., 1902) Staff., 1905, 687 (in lungs of American toads and frogs).—Klein, 1905, 3, 5, 6; 1905, 61.

PNEUMONŒCES—Continued.

capyristes Klein, 1905, 60–65, pl. 5, figs. 1–2 (in Rana hexadactyla; from India); 1905, 2–7, pl. 1, figs. 1, 2.

complexus Seely, 1906, 249–252, figs. 1–2 (in Rana pipiens; North Carolina).

longiplexus (Staff., 1902) Staff., 1905, 681; 1905, Apr. 11, 687 (American frogs and toads).—Klein, 1905, 6; 1905, 64.—Seely, 1906, 249.

medioplexus (Staff., 1902) Staff., 1905, Apr. 11, 687 (syn. Ostiolum formosum) in American frogs and toads).—Klein, 1905, 3, 6; 1905, 61.—Seely, 1906, 252.

similiplexus (Staff., 1902) Staff., 1905, Apr. 11, 687 (in American frogs and toads).—Klein, 1905, 6; 1905, 64.—Seely, 1906, 252.

similis (Looss, 1899) Looss, 1902m, 762.—Klein, 1905, 2, 3, 4, 5, 6; 1905, 61.

variegatus (Rud., 1819) Looss, 1902m, 806.—Engler, 1904, 186.—Klein, 1905, 1, 2, 3, 4, 5, 6; 1905, 59.

varioplexus (Staff., 1902) Staff., 1905, Apr. 11, 687 (in American frogs and toads).—Klein, 1905, 3, 6; 1905, 61.

PODOCOTYLE (Duj., 1845) (tld. angulatum = atomon), see also (Podocotyle).—R. Bl., 1891, 609.—Braun, 1893a, 885, 886, 890, 909, 910; 1900h, 3.—Fil., 1857c, 9.—Jægers., 1901, 982.—Looss, 1899b, 528, 535, 538, 542, 647; 1902m, 721, 757, 764, 770, 771, 772, 827 (type angulatum).—Luehe, 1900u, 487–492; 1900v, 792; 1900, 562; 1901g, 42.—Mont., 1888a, 92, 105; 1892, Oct. 7, 214 (gen. of Distominæ); 1893, 150, 151, 152, 153, 155, 167, 168.—Odhn., 1905, 326 (type atomon).—Pratt, 1902, 888 (related to Opisthorchiinæ), 896.—Sons., 1890, 140.—Stiles, 1901, 193, 196.—Stiles & Hass., 1898a, 92–93, 97 (syns.: ? Schisturus Rud., Dist. (Podocotyle) Duj.), type angulatum.—Stoss., 1892, 4; 1898, 24; 1902, 582.

angulata (Duj., 1845) Jægers., 1901, 982, see atomon.

atomon (Rud., 1802) Odhn., 1905, 320–326, pl. 2, figs. 9–10 (syns.: Fasc. at., Dist. at., D. angulatum, D. simplex Rud. of Olss., Allocreadium at.), type of genus.—Nicoll, 1907, 68, 69, 70, 71, 73–77, pl. 1, figs. 1–2 (syns.: Psilost. redactum, Dist. simplex) (in Centronotus grumellus, Cottus bubalis, C. scorpius, Gasterosteus aculeatus, Gobius ruthensparri, Liparis montagui, Motella mustella, Zoarces viviparus).

contortum (Rud., 1819) Stoss., 1898, 24–25 (in Orthogoriscus mola; Triest) [type of Accacœlium].—Barbagallo & Drago, 1903, 409 (in Orthag. mola; Catania).

fractum (Rud., 1819) Stoss., 1898, 26 (in Box salpa; Triest).—Barbagallo & Drago, 1903, 409 (in B. s.; Catania).—Osborn, 1903, 316.—Par., 1902, 4 (in B. s.; Portoferrajo).

furcatum (Bremser, 1819) Stoss, 1898, 26 (in Mullus barbatus, M. surmuletus, Solea vulgaris; Triest); 1899, 5.—Barbagallo & Drago, 1903, 409 (in Mullus surmuletus, Solea vulgaris; Catania).—Fischder., 1903h, 548.—Jægers., 1901, 982.—Looss, 1902m, 771.—Luehe, 1900, 490, 491 (furcata); 1901, 475.

macrocotyle (Dies., 1858) Stoss., 1898, 25 (in Orthagoriscus mola; Triest).—Barbagallo & Drago, 1903, 409 (in Or. mola; Catania).

olssoni Odhn., 1905, 326, 327, new name for Dist. simplex of Olss. (in Gadus melanostomus, Lumprenus maculatus; West Coast of Sweden).

pachysomum (Eysenhardt, 1829) Stoss., 1898, 27 (in Mugil; Triest).—Barbagallo & Drago, 1903, 409 (in Mugil cephalus; Catania).

pedicellatum (Stoss., 1887) Stoss., 1898, 25 (in Chrysophrys aurata; Triest).—Barbagallo & Drago, 1903, 409 (in Chrys. aur.; Catania).

planci Stoss., 1899, 5, fig. 9 (in Ranzania truncata; Triest).—Looss 1902m, 637.

reflexa (Crep., 1825) Odhn., 1905, 324, 326–327 (in Cyclopterus lumpus; West Coast of Sweden).

retroflexum (Mol., 1861) Stoss., 1898, 26–27 (in Belone acus; Triest).—Barbagallo & Drago, 1903, 409 (in Bel. ac., Exocœtus volitans; Catania).

species of Mueller, 1897, 23–24, 26, pl. 3, fig. 8 (in Numenius arquatus).

(PODOCOTYLE) Duj., 1845a, 388, 401 (tld. angulatum).

angulatum Duj., 1845a, 386, 401–402, designated type of subg. by Stiles & Hass., 1898a, 93, (t. h. Anguilla vulgaris in the Morbidan).

fractum (Rud., 1819) Stoss., 1886, 49 (to Podocotyle by Stoss., 1898, 26).

furcatum (Bremser, 1819) Duj., 1845a, 402 (to Podocotyle by Stoss. 1898, 26).

(PODOCOTYLE)—Continued.

gibbosum (Rud., 1802) Duj. 1845a, 402.

macrocotyle (Dies., 1858) Stoss., 1898, 25.

pachysomum (Eysenhardt, 1829) Stoss., 1886, 57 (to Podocotyle by Stoss., 1898, 27).

perlatum (Nord., 1832) Duj., 1845a, 387, 401 (to D. (Echinost.) by Stoss., 1886, 62) (type of Asymphylodora Looss, 1899b, 598).

retroflexum (Mol., 1861) Stoss., 1886, 60 (to Podocotyle by Stoss., 1898, 26).

unicum (Mol., 1859) Stoss., 1886, 58.

POLISTOMEÆ Mont., 1888a, 13, 34, 42 (see Polystomeæ).

POLISTOMUM Sons., 1889, 283, for Polystomum.

POLYANGIUM Looss, 1902m, 584, 633, 634, 639, 642, 648, 652, 658, 667, 668, 675, 681, 684, 687–688 (tod. linguatula), 689, 698, 699.

linguatula (Looss, 1899) Looss, 1902m, 632, 688, 689, 697, 698, 885, pl. 30, fig. 145–150.

POLYCOTYLA Blainv., 1828a, 569–570 (family name).—Johnston, 1865a, 31.—Nord., 1840, 596.

POLYCOTYLE Will.-Suhm, 1870, 9 (m. ornata); 1871, 183.—Brand., 1888a, 33, 34, 35, 37, 58, 61; 1890a, 562, 563, 564, 567, 584.—Braun, 1892a, 581, 698, 713, 715, 717, 718, 723, 732; 1893a, 879, 881, 886, 887, 890, 892, 895, 899, 900, 901, 917; 1895b, 121, 136.—Gamb., 1896, 73.—Mont., 1888a, 10, 12, 15, 54, 90, 91, 104; 1892, Oct. 7, 196, 197, 214 (Diplostominæ).—Pratt, 1902, 890.—Schneidemuehl, 1896, 295 (Polykotyle).—Tasch., 1879, 256.—Wolf, 1903, 616, 617.

1896: Polykotyle Schneidemuehl, 1896, 295, for Polycotyle.

ornata Will.-Suhm, 1870, 9–11 (in Alligator lucius; Charleston); 1871, 183–185, pl. 11, fig. 1.—Brand., 1888a, 15, 58 (in All. luc.); 1890a, 584–585.—Braun, 1892a, 581, 733; 1893a, 901.—Pavesi, 1881, 294.—Poir., 1886, 339–345, pl. 18, fig. 7, pl. 19, fig. 1, 3, 5, 6, pl. 20, fig. 5 (in All. luc.).—Reported also for Alligator mississippiensis.

POLYCOTYLEA Dies., 1850a, 288 (tribe), 289, 408 (tribe III of Trematoda, subo. II), 416 (tribe I of Bdellidea, subo. III); 1858e, 314 (fam. of Trematoda cotylophora), 367.—Brand., 1888a, 15.—Braun, 1890a, 515.—Cerf., 1899a, 351.—Goldb., 1855a, 17, 18.—Mont., 1888a, 83, 84; 1903, 336 (section, contains: Polystomidæ Ben., 1858; Octocotylidæ Ben. & Hesse, 1863).—Tasch., 1879, 233, 234.

POLYCOTYLEÆ Dies., 1839a, 234.—Cobbold, 1877, 238.

POLYCOTYLIDÆ Cobbold, 1877f, 326.—Braun, 1893a, 886.—Mont., 1888a, 104.

POLYCOTYLINÆ Mont., 1892, Oct. 7, 214 (subf. of Holostomidæ).—Braun, 1893a, 890, 892.

POLYKOTYLE Schneidemuehl, 1896, 295, for Polycotyle.

POLYORCHIS (Stoss., 1888) [nec Polyorchis Agassiz], renamed Pleorchis 1896, (type by absolute tautonymy polyorchis); 1892, 4; 1898, 30.—Braun, 1893a, 885, 886, 894, 909, 911; 1895b, 138; 1901b, 54.—Looss, 1894a, 174; 1896b, 59; 1902m, 846.—Mont., 1893, 148, 149, 150, 151, 154.—Ofenheim, 1900, 160.—Rail., 1896, 160 (=Pleorchis).—Sons., 1890, 134, 135.—Stiles & Hass., 1898a, 92 (syn. of Pleorchis).

formosum (Sons., 1890) Stoss., 1892, 143 (in Grus cinerea; Pisa).

molle (Leidy, 1856) Mont., 1896, 166.

polyorchis (Stoss., 1889) Mont., 1896, 166.

(POLYORCHIS) Stoss., (1888), subg. of Dist., [type polyorchis].

cygnoides (Zed., 1800) Stoss, 1889, 60.

molle (Leidy, 1856) Stiles & Hass., 1894h, 162–163, fig. 2; 1895a, 737–741, pl. 3, figs. 1–3.

ragazzii Setti, 1897, 8 (type of Syncœlium Looss, 1899).

POLYSARCUS Looss, 1899b, 561 (tod. westermanni) [nec Polysarcus Fieb., 1853, orthopteron; Sauss, 1859, orthopteron; Lefèvre, 1876, coleopteron; Polysarca Schin, 1866, dipteron]; 1900, 605.—Braun, 1900h, 6; 1901e, 329 (=Paragonimus).—Luehe, 1900, 557.—Stiles, 1901, 189.—See Paragonimus.

westermanni (Leuck., 1889) Looss, 1899b, 561.

POLYSSICHIA Cosmovici, 1887 (contains Aspidogaster, Diplozoon, Diporpa, Gyrodactylus, Octobothrium, Polyst.).—Mont., 1888a, 84.

POLYSTOMA Zed., 1800a, xviii, 199–203 (nec Polyst. Steph. Col., 1835), includes Linguatula serrata Frœlich, Hexathyridium pinguicola Treutler, 1793) (type was clearly intended to be Planaria uncinulata = Polyst. ranæ; name Polyst. was in MS. in 1788 based on this species, see Zed., 1803a, 223).—Andral, 1829d, 617.—Audouin, 1828b, 193.—Baer, 1826a, 126.—Ben., 1858a, 1861a, 11 (Polystomum).—Ben. & Hesse, 1864, 61.—E. Bl., 1847, 331.—R. Bl., 1888a, 312 (Polystomes).—Brand., 1891d, 9.—Braun, 1883a, 50; 1889k, 620, 621; 1890a, 413, 416, 424, 433, 435, 451, 454, 470, 479, 480, 481, 483, 487, 490, 491, 492, 493, 496, 498, 504, 511, 514, 515, 516, 517, 522, 523, 538, 546; 1890b, 125, 127, 128; 1890e, 597; 1891d, 421; 1892a, 753; 1893a, 890, 891.—Brem., 1824, 135.—Burm., 1837a, 530; 1856a, 251.—Carus, 1863, 478.—Cerf., 1899a, 348, 350, 351, 359, 371.—delle Chiaje, 1833, 13; 1835b, 76–90; 1837a, 5–19 (Polistoma in blood of man); 1837b, 245–246; 1843b, 51.—Cobbold, 1866, 7; 1877, 238; 1879b, 41.—Cosmovici, 1887a, 129.—Crep., 1839, 290.—Cuvier, 1817, 42.—Deslongchamps, 1824mm, 648–650; 1828d, 192–193.—Dies., 1839, 234; 1850a, 288, 409 (syn. of Hexathyridium), 412–413 (includes: Plan. Braun, Linguatula Frœlich, Fasc. Gmelin, Hexathyridium Blainv.), 416 (of Delaroche, syn. of Plagiopeltis), 419 (of Kuhn, syn. of Onchocotyle), 420 (of delle Chiaje, syn. of Solenocotyle), 421 (of Duj., syn. of Diclibothrium), 609 (of Rud., pars syn. of Pentast.); 1858e, 314, 371–372 (only species integerrimum).—Duj., 1845a, 318.—Eichwald, 1829a, 249.—Eiss, 1838, 21.—Fischer, 1840, 159.—Gamb., 1896a, 57, 59, 73.—Goldb., 1855, 17.—Goldschmidt, 1902e, 874.–Goto, 1891a, 174, 183, 185, 187.—Hahn, 1900a, 174–175.—Haswell, 1892a, 458; 1892b, 149; 1893e, 112, 144.—Hémont, 1827, 9.—L'Herminier, 1826, 10.—Hoyle, 1890, 535–537, 539 (two species; best known P. integerrimum; Hexathyridium is probably a synonym).—Jackson, 1888, 644, 646, 647, 654.—Joy, 1835a, 504.—Juel, 1889, 33.—Kath., 1894a, 130, 148.—Lamarck, 1816b, 175–176.—Leuck., 1863a, 450, 527.—Looss, 1892a, 72, 73, 95; 1893b, 810.—Mayer, 1841a, 20.—Mlinarich, 1832, 14.—Mont., 1888a, 8, 9, 11, 13, 14, 29, 37, 38, 40, 42, 44, 53 (Polystomum), 54, 56, 57, 58, 59, 60, 63, 64, 66, 67, 70, 83, 84, 86, 89, 100; 1892, 109; 1892, Oct. 7, 186, 213 (gen. of Polystominæ); 1893, 110; 1903, 336 (subf. Polystominæ).—Moul., 1856a, 10, 11.—Nord., 1832a, 60, 69; 1840, 544, 592, 593, 596–597.—Olfers, 1816, 22, 41.—Pag., 1857, 52.—Pintner, 1891, 727.—Pratt, 1900, 645, 646, 647, 650, 656, 659, fig. 23.—Rafinesque, 1815, 151 (syn. of Hexathyridia).—Rud., 1809a, 6, 22–23, 38, 441, pl. 6, figs. 1–6; 1819a, 125, 435–436, 584.—St.-Remy, 1898, 558.—Schneider, 1866, 334.—Slawikowski, 1819, 70.—Stoss., 1898a, 10, 11.—Tasch., 1879, 43, 50, 58, 62, 64, 69; 1879, 232, 233, 251–252 (syns.: Hexathyridium Blainv., Planaria Braun, Linguatula Frœlich, Fasc. Gmelin).—Wagener, 1857, 50, 72.—Wallenstedt, 1847, 7.—Zeller, 1876, 23 June, 238–274, pls. 17–18.

—— : Polystomum.

1837: Polistoma delle Chiaje, 1837a, 5–19, for Polystoma.

1888: Polystomnm Mont., 1888a, 53, misprint.

——— of Kuhn, 1829c; 1830a; 1830b, 185–187 (in Squalus catulus).—Tasch., 1879, 252 (syn. of Onchocotyle Dies.)

——— of Duj., 1845a, 319.—Tasch., 1879, 254 (syn. of Diplobothrium Leuck.).

——— Delaroche, 1811, 271–272 [n. g.?] (type species thynni).—Audouin, 1828b, 193 (?syn. of Polyst. duplicatum).—Blainv., 1824a, 514 ("M. de Lamarck a adopté ce genre de Delaroche; il est établi sur un animal de la famille des sangsues, suivant nous"), 515.—Rafinesque, 1815, 151 (renamed Hexost.).—Tasch., 1879, 249 (syn. of Hexacotyle Blainv.).—See Polyst. thynni, p. 353.

appendiculatum Kuhn, (1829c), 460–463, pl. 11, figs. 1–3 (t. h. Squalus catulus); (1829), 342.– Ben., 1858a, 1861a, 54, 55 (to Onchocotyle), 191, 192.—Bl., 1847, 336 (of Nord.).—Cerf., 1899a, 349, 350, 351, 352–356, 359, 373, 375, 378 (in Mustelus lævis, M. vulgaris, Scyllium catulus), 434.—Cobbold, 1872b, 90; 1879b, 41. Crep., 1838, 84; 1839, 290.—Dies., 1850a, 419 (to Onchocotyle as type); 1858e, 371 (to Onchocotyle).—Duj., 1845a, 321. Goto, 1894a, 222 (Japan).—Nord., 1832a, 80–82, pl. 5, figs. 6–7 (in Squalus catulus); 1840, 601 (to Hexabothrium).– Scott, A., 1901, 344 (to Onchocotyle).—Tasch., 1879, 27, 28 (to Onchocotyle); 1879, 253.—Thaer, 1850, 602–630, pl. 20–22, figs. 1–45; 1851, 34 pp., pls. 1–3.

armatum (Leuck., 1835) Duj., 1845a, 319 (to Polyst. (Hexacotyle)).—E. Bl., 1847, 335.– Dies., 1850a, 421 (to Diclibothrium). Tasch., 1879, 254 (to Diplobothrium).– Type of Diclibothrium 1835.

borealis (Ben., 1853) Wagener, 1857, 72. Cerf., 1899a, 359, 377.—Dies., 1858e, 371 (to Onchocotyle).—St.-Remy, 1890, 41.

POLYSTOMA—Continued.

coronatum Leidy, 1888, 127 (in terrapin; eastern U. S. A.); 1904a, 213.—Braun, 1890a, 511, 538, 548, 552 (in Cistudo carolina).—Pratt, 1900, 659.

denticulatum (Rud., 1805) Rud., 1808a, 180; 1809a, 447–449, pl. 12, fig. 7 (to Polyst. (Pentast.)) (in Capra americana, C. hircus).—R. Bl., 1890a, 264.—Dies., 1850a, 615 (to Pentast.).—Olfers, 1816, 42.

duplicatum Rud., 1819a, 125, 438–439, pl. 2, fig. 6 (P. thynni Delaroche, 1811, renamed) (in Scomber thynnus; Balearic Isles).—Audouin, 1828, 193.—Crep., 1839, 290.—Deslongchamps, 1828d, 193.—Dies., 1850a, 417 (to Plagiopeltis as type) in Thynnus brachypterus.—Duj., 1845a, 318–319 to Polyst. (Hexacotyle).—Kroyer, 1838–40a, 251, 596 (in Thynnus vulgaris Cuv.).—Nord., 1832a, 62; 1840, 598 (syn. of P. thynni).—Tasch., 1879, 250 (syn. of Hexacotyle thynni).

hassalli Goto, 1895, 352 (in Kinosternon pennsylvanicum; Maryland); 1899, 276–278, pl. 21, figs. 16, 17.—Pratt, 1900, 656, fig. 23; 657, 659.—St.-Remy, 1898, 558.

integerrimum (Frœlich, 1791) Rud., 1808a, xxv, pl. 6, figs. 1–6; 1809a, 451–455, pl. 6, figs. 1–6, to P. (Hexastoma) (includes: Planaria uncinulata Braun, 1792; Linguatula integerrima, 1791; Fasc. uncinulata, 1790, Polystoma ranæ, 1800; Linguatula integerrimum); 1819a, 125 (in Rana temporaria; Gryphiæ, Jun.; R. esculenta, Bufo variabilis).—Baer, 1826a, 126; 1827a, 680–689, pl. 32, figs. 7–9.—Ben., 1858a, 1861a, 54, 169, 171, 172, 196; 1870c, 140.—Ben. & Hesse, 1864, 84–87, 1 fig. (integerrinum).—Bettend., 1897a, 4; 1897, 308.—E. Bl., 1847, 331–334, pl. 14, fig. 3.—Braun, 1883a, 41, 44, 48, 49, 51, 56, 71, fig. 10; 1889k, 621; 1890a, 407, 408, 410, 415, 419, 421, 424, 426, 428, 430, 433, 436, 439, 442, 445, 449, 453, 454, 455, 456, 458, 461, 464, 465, 468, 471, 472, 475, 480, 482, 483, 487, 490, 491, 492, 493, 494, 495, 497, 499, 500, 501, 503, 511, 512, 538, 548, 552; 1890d, 568; 1890e, 596; 1891a, 52, 53, 54; 1892a, 753; 1894a, 1160; 1895b, 125, 130, fig. 42; 1906, 131, fig. 66 (in frog).—Bremser, 1824c, pl. 10, fig. 26.—Civinini, 1842.—Cobbold, 1858, 162; 1879b, 452.—Crep., 1837, 322; 1839, 290.—Deslongchamps, 1828a, 193.—Dies., 1850a, 412–413 (syns.: Plan. uncinulata Braun, Linguatula integ., Fasc. uncinata Gmelin, Polyst. ranæ Zed., Hexathyridium integ. Blainv.); 1858e, 372 (only species) (in Rana platyrhinus).—Duj., 1845a, 320.—Eichwald, 1829a, 249.—Fraip., 1880a, 400; 1880c, 433; 1883a, 36.—Gamb., 1896a, 55, 58–59, figs. 24, 26.—Goldschmidt, 1902a, 397–444, pls. 22–24, figs. 1–40 (embryology); 1902b, July, 398–399; 1902c, 180–189, figs. 1–11 (development); 1902d, 736; 1902e, 874; 1905, July, 64–65.—Goto, 1891a, 184.—Halpin, 1901a, 291–363, pls. 10–14 (embryology); 1902a, 395–398; 1904a, 444.—Hoyle, 1890, 537–539, fig. 3 B.—Ijima, 1884c, 635–639.—Jackson, 1888, 643, 644, 645, 646, 648–649, 650 (in Rana temporaria, R. esculanta, Bufo viridis).—Janicki, 1903a, 241 ff.—Juel, 1889, 14.—Kath., 1894a, 132, 141, 142, 146, 152.—Kerbert, 1881a, 535, 554, 556, 572.—Kholodk., 1899a, 148, fig. 175.—Knoch, 1862, 101.—Kowal., 1895, 372–390, pl. 8, figs. 11–13; 1896d (2), 252 (in Rana fusca; Dublany); 1904, (9), 24 (in Rana temporaria; Dublany).—Lejtenyi, 1881a, 3.—Leuck., 1879, 26, 52; 1886d, 19, 40.—Linst., 1903, 279.—Looss, 1885b, 17, 18, 19, 21, 24.—Macé, 1882a, 26, 29, 78.—Mayer, 1841a, 26, 34.—Mont., 1888a, 10, 18, 39, 44, 58, 59, 70; 1892, Oct. 7, 186; 1893, 110, 111.—Mueh., 1898, 11, 17–18.—Nord., 1832a, 62, 79; 1840, 546, 601.—Olfers, 1816, 42.—Pag., 1857, 47–49, pl. 6, figs. 10–13 (in braunen Frösche).—Par., 1894, 471.—Pégot, 1900, 162–164.—Pintner, 1891, 727, 728.—Polonio ——.—Sieb., 1835, 70.—Sons., 1893, 187 (in Bufo viridis Laur.).—Stieda, 1870, 675; 1871, Jan., 660–678, pl. 15, figs. 1–12.—Stoss., 1889, 29; 1898, 10–11.—Tasch., 1879, 33, 35, 43, 55, 56, 58, 60, 61; 1879, 252 (in Rana temporaria, R. esculenta, Bufo viridis).—Walter, 1866, 65.—Will.-Suhm, 1871, 181–185; 1872, 22 March, 29–39, pl.—Zeller, 1872, v. 22 (1), 1–24, pls. 1–2; 1872, 25–28, pl. 3, figs. 1–12; 1872, Sept., 99–112; 1873, 51–55.—Woodland, 1904, 404–405, 1 fig.—Reported also for Rana fusca, Hyla viridis.

integerrinum Ben. & Hesse, 1864, 84–87, 1 fig. (see integerrimum).—Pégot, 1900, 162–164.

loliginis delle Chiaje, 1823, pl. 92, fig. 2 (in Loligo vulgaris; Naples).—Ben. & Hesse, 1864, 84.—Braun, 1890a, 518.—Dies., 1850a, 420 (syn. of Solenocotyle chiajei, type of Solen.).—Mont., 1888a, 89.—Tasch., 1879, 250.

midas Kuhl & van Hasselt, (1824).—Baird, 1853a, 41 (=P. ocellatum Rud.).—Nord., 1840, 600.

POLYSTOMA—Continued.

mydæ Kuhl & van Hasselt, (1822), 113; 1824a, 310.—Crep., 1846, 146.—Dies., 1850a, 413 (syn. of P. ocellatum Rud.).—Tasch., 1879, 252 (syn. of P. ocellatum).—Reported for Chelonia mydas.

oblongnum Mont., 1888a, 57 (for oblongum).

oblongum R. Wright, 1879, 12–15, pl. 1, figs. 9–11 (in Aromochelys (Sternothærus) odoratus; Toronto).—Braun, 1890a, 511, 538, 548, 552.—Goto, 1899, 277, pl. 21, fig. 18.—Leidy, 1888, 127.—Mont., 1888a, 57 (oblongnum).—Pratt, 1900, 659.—Staff., 1900, 405, 414; 1902, 483 (in Chelydra serpentina); 1905, Apr. 11, 690 (in Chrysemys picta; Chel. serp.; Canada).—Reported for Sternothærus odoratus.

ocellatum Rud., 1819a, 125, 436–437 (in Testudo orbicularis; Arimini).—Ben. & Hesse, 1864, 84.—Blainv., 1828, 571, to Hexacotyla.—E. Bl., 1847, 335–336.—Braun, 1890a, 418, 434, 439, 440, 452, 453, 465, 472, 477, 494, 506, 511 538, 548, 552; 1891a, 52, 54; 1891d, 421; 1892a, 637; 1893b, 179, 185 (in Emys europæa).—Crep., 1838, 84; 1839, 290.—Deslongchamps, 1828d, 193.—Dies., 1850a, 413 (syns. P. mydæ, Hexacotyle oc.).—Duj., 1845a, 319–320.—Gamb., 1896, 59.—Giebel, 1857, 266.—Goto, 1891a, 183.—Ijima, 1884c, 636, 638.—Jackson, 1888, 649, 650.—Leidy, 1888, 127.—Looss, 1885b, 21, 22, 24, pl. 23, fig. 19.—Macé, 1882a, 26.—Mont., 1888a, 18, 58; 1892, Oct. 7, 186; 1893, 110, 111.—Nord., 1840, 600 (syn. of Hexacotyle oc.).—Par., 1894.—Sons., 1889, 283 (Polistomum); 1893, 183 (in Emys lutraria).—Stoss., 1890, 51.—(Tasch., 1879, 252 (syns. P. mydæ, Hexacotyle oc.) (in Emys europæa, Halichelys atra).—Reported also for Cistudo europæa.

pinguicola (Treutler, 1793) Zed., 1800a, 203 [type of Hexathyridium 1793].—Boele, 1828a, 33.—Bremser, 1819a, 233, pl. 4, figs. 15–17; 1824, 135, 272–280, pl. 9, fig. 2.—delle Chiaje, 1833, 13–14, 117–118, pl. 2, fig. 14.—Cobbold, 1866, 7; 1876, 211.—Crep., 1839, 290.—Deslongchamps, 1828d, 193.—Dies., 1850a, 410 (to Hexathyridium).—Duj., 1845a, 319.—Dunglison, 1893, 821, 900.—Eichwald, 1829a, 249.—Eiss, 1838, 21.—Hémont, 1827, 17.—L'Herminier, 1826, 14.—Joy, 1835a, 504, 519.—Kuech., 1855, 464.—Lundborg, 1817, 8.—Mlinarich, 1832, 14.—Nord., 1840, 594 (to Linguatula), 601.—Olfers, 1816, 42.—Prunèyre, 1823, 7.—Puettner, 1837, 4.—Rud., 1809a, 455–456, to P. (Hexast.); 1819a, 125, 437–438.—Sjöbeck, 1830, 10.—Slawikowski, 1819, 23, 25, 70, 141.

pinguiculum Joy, 1835a, 505, for pinguicola.

proboscideum Rud., 1814a, 106–107 (Echinorhynchus crotali Humboldt, 1808, renamed), to P. (Pentast.).—Dies., 1850a, 612 (to Pentast.).—Leidy, 1852, 97.—Nord., 1840, 645 (syn. of Porocephalus crotali, type of Poroc.).—Olfers, 1816, 42. Now an arachnoid.

ranæ Zed., 1800a, xviii, 203, 204–205, pl. 4, figs. 1–3 (in Rana temporaria; bladder, Europe) (includes Plan. uncinulata Braun, 1790, from Rana esculenta; Europe); 1803a.—Dies., 1850a, 412 (syn. of P. integerrimum).—Rud., 1809a, 451, 452 (=P. integerrimum).—Stoss., 1898, 10.

sanguicola delle Chiaje, 1833, 14 (venarum, renamed), 118; 1834, ——; 1837a, 5–19.—Cobbold, 1876, 211.—Dav., 1877a, 334.—Dies., 1850a, 410 (syn. of Hexathyridium venarum).—Dolley, 1894a, 1006.—Dunglison, 1893, 821, 900.—Marcacci, 1843a.

sanguineum delle Chiaje, 1837b, 245 (based on 1837a) (in Homo).—Crep., 1839, 290.—Eiss, 1838, 21.—Leuck., 1863a, 585.—Moniez, 1896, 108.—Sieb., 1839, 164.

scymni ainosi Dies., 1858e, 371 (to Onchocotyle) based on Wagener, v. 13, 72.—Cerf., 1899a, 360.

serratum (Frœlich, 1889) Zed., 1800a, 203 [type of Linguatula, 1789]; 1803a, 230.—Blainv., 1824a, 514 (type of tétragule).—Dies., 1850a, 616 (to Pentast.).—Nord., 1840, 594 (to Linguatula).—Olfers, 1816, 42.—Risso, 1826, 263.—Rud., 1809a, 449–451 to P. (Pentast.); 1819a, 124 (=Pentast. serratum).—Reported for Lepus timidus.

tænioidea Nord., 1840, 595, for tænioides.

tænioides Rud., 1809a, 441–447, pl. 12, figs. 8–12 (Tænia rhinaria Pilger, 1802, renamed), to P. (Pentast.) (in Equus cab., Canis fam.: France); 1810a, 256; 1814a, 107.—Anacker, 1890m, 506.—Blainv., 1824a, 513 (type of "prionoderme").—R. Bl., ——, 261.—Braun, 1903, 3. ed., 337 (syn. of Linguatula rhinaria).—Dies., 1850a, 610 (to Pentast.).—Nord., 1840, 595 (tænioidea, to Linguatula).—Olfers, 1816, 42.

POLYSTOMA—Continued.

thynni Delaroche, 1811, 271–272, pl. 2, fig. 3 (in Scomber thynnus; Maroque).—Blainv., 1828a, 571 (type of Hexacotyla).—E. Bl., 1847, 335.—Crep., 1838, 84.—Dies., 1850a, 417 (syn. of Plagiopeltis duplicata, type of Pl.).—Lamarck, 1816b, 176.—Nordt., 1832a, 62; 1840, 597–598 (syns.: Hexacotyle thynni, P. duplicatum), 600.—Risso, 1826, 263.—Tasch., 1879, 250 (syn. of Hexacotyle thynni).

uncinatum Macé, (1880a).—Braun, 1890a, 511, 538, 548, 552.—Stoss., 1898, 10 (in Rana temporaria; France).

uncinulatum Macé.—Braun, 1890a, 418, for uncinatum.

venarum (Treutler, 1793) Zed., 1803a, 231.—delle Chiaje, (1834a) 1833, 14–15, 118–119, pl. 2, fig. 15.—Cobbold, 1866, 7.—Crep., 1839, 290.—Dies., 1850a, 410.—Dunglison, 1893, 821, 900.—Hémont, 1827, 16.—Moniez, 1896, 108.—Olfers, 1816, 42.—Rud., 1809a, 456–457; 1819a, 136.—Slawikowski, 1819, 24, 70.—Reported for Homo.

POLYSTOMA (HEXACOTYLE) Duj., 1845a, 318–319.

armatum (Leuck., 1835) Duj., 1845a, 319.—Type of Diclibothrium, 1835.

duplicatum (Rud., 1819) Duj., 1845a, 318–319 (to Plagiopeltis as type by Dies., 1850a, 417).

POLYSTOMA (HEXAST.).

integerrimum (Frœlich, 1791) Rud., 1809a, 451–455.

pinguicola (Treutler, 1793) Rud., 1809a, 455–456.

POLYSTOMA (PENTASTOMA).

denticulatum (Rud., 1805) Rud., 1809a, 447–449, pl. 13, fig. 7 (to Pentast. by Rud., 1819a, 124, 423).

proboscideum Rud., 1814a, 106–107 (type of Porocephalus; Echinorhynchus crotali Humboldt, 1808, renamed) (to Pentast. by Rud., 1819a, 124).

serratum (Frœlich, 1789) Rud., 1809a, 449–451 (to Pentast. by Rud., 1819a, 124).

tænioides Rud., 1809a, 441–447, pl. 11, figs. 8–12 (in Canis familiaris; France) (Tænia rhinaria Pilger, 1802, renamed) (to Pentast. by Rud., 1819a, 123).

POLYSTOMATA Zed., 1800a, 203, plural of Polystoma.

POLYSTOMATIDÆ Gamb., 1896a, 53, 55, 73.—Scott, 1901, 141, 145.

POLYSTOMATINÆ Gamb., 1896a, 73.

POLYSTOMEA Ben.—Braun, 1890a, 516.—Olss., 1893, 4.

POLYSTOMEÆ Leuck.—Braun, 1883a, 40, 58; 1890a, 516, 517, 523, 524, 532; 1890b, 127.—Cerf., 1894, 948; 1895e, 523 (of Tasch.); 1895h, 914, 919; 1896, 500, 509, 515; 1898b, 361; 1899a, 365, 452 (of Tasch.).—Haswell, 1892a, 457.—Hoyle, 1890, 539 (includes Octobothriidæ, Polystomidæ, Microcotylidæ, Gyrodactylidæ).—Jackson, 1888, 642, 644, 646, 654 (includes same as Hoyle).—Maclaren, 1904, 598.—Mont., 1888a, 7, 10, 11, 13, 15, 16, 18, 20, 26, 27, 28, 31, 32, 34, 36, 37, 38, 41, 47, 48, 50, 53, 54, 56, 66, 67, 70, 84, 86, 87, 88, 90, 96, 98, 107, 108; 1888a, 16, 34, 42 (Polistomeæ); 1891, 108.—Par.,—. Par. & Perugia, 1890, 6; 1890, 225–242; 1891, Mar. 7, 319.—Schneidemuehl, 1896, 296.—Sons., 1890, 175.—Tasch., 1879, 33, 56, 57, 68; 1879, 234, 235, 236–237, 238.

1888: Polistomeæ Mont., 1888a, 16, for Polystomeæ.

POLYSTOMES R. Bl., 1888a, 312, French word, see Polystoma.

POLYSTOMIDÆ Cunningham, 1884a, June 12, 399.—Hoyle, 1890, 539 (includes Polyst., Onchocotyle, Erpocotyle, Diplobothrium).—Jackson, 1888, 654 (includes Polyst., Onchocotyle).—Pratt, 1900, 646 (of Tasch.) (includes Polystominæ, Octocotylinæ, Microcotylinæ).—Scott, T., 1901, 141.

POLYSTOMIDÆ Braun, 1890a, 511, 516, 517, 523, 533, 538; 1893a, 890.—Carus, 1863, 477.—Cobbold, 1879b, 4.—Cunningham, 1884, 399; 1887a, 279.—Leuck., 1886d, 117.—Mont., 1888a, 8, 11, 13, 15, 16, 18, 20, 30, 34, 37, 52, 66, 70, 86, 89, 91, 100, 108; 1888a, 16, 88 (Polistomidæ), 89 (Polystomidaes); 1892, Oct. 7, 198, 213 (f. of Eterocotylea, containing subf. Polystominæ Ben., Octocotylinæ Ben. & Hesse, Microcotylinæ Tasch.); 1903, 336 of Ben. & Hesse, 1858 (subf. Polystominæ (g. Polystomum)).—Par. & Per., 1889, 742; 1890, 7.—Poir., 1886, 345.—St.-Remy, 1898, 522, 523, 544.—Schneidemuehl, 1896, 296.—Stoss., 1898, 10.—Tasch., 1879, 69; 1879, 235, 237, 251.

1888: Polistomidæ Mont., 1888a, 16, 88, for Polystomidæ.

1888: Polystomidaes Mont., 1888a, 89, typographical error.

POLYSTOMIDEA Mont., 1888a, 84.

POLYSTOMIDES Mont., 1888a, 86.—Tasch., 1879, 235.—R. Bl., 1888a, 541 (embraced in subo. Polystomiens).

POLYSTOMIENS [French] R. Bl., 1888a, 541 (suborder, includes: Tristomidés, Polystomidés, Gyrodactylidés).

POLYSTOMINÆ Pratt, 1900, 646, 650 (of Ben.) (includes Polyst., Erpocotyle, Onchocotyle, Diplobothrium, Sphyranura).

POLYSTOMINÆ Ben.—Braun, 1893a, 890.—Mont., 1892, Oct. 7, 213 (subf. of Polystomidæ); 1903, 336 (new subf. of Polystomidæ).—St.-Remy, 1898, 558.

POLYSTOMIS Crep., 1838, dative of Polyst.

POLYSTOMNM Mont., 1888a, 53, misprint for Polystomum.

PROBOLITREMA Looss, 1902m, 855, 857 (in subf. Anaporrhutinæ), 858, 859, 860, 863 (diagnosis), fig. 6 (tod. ricchiardii).

capense Looss, 1902m, 855, 857, 863, "Anaporrhutum ricchiardii Lopez" of Ofenh., renamed.

ricchiardii (Lopez, 1888) Looss, 1902m, 855, 857, 863 (ricchardii, misprint for ricchiardii).

PROGONUS Looss, 1899b, 643 (tod. mülleri) (*ὁ προγονος*=ancestor) [not Progona Berg, 1882, insect]; 1900, 602, 603; 1901, 208; 1902m, 732 (renamed Genarches).—Fuhrmann, 1904, 61.—Luehe, 1901, 481, 486.—Pratt, 1902, 889, 905.—Stiles, 1901, 189.

mülleri (Levin., 1881) Looss, 1899b, 643; 1902m, 732, type of Genarches, 1902.—Luehe, 1901, 481.

PRONOCEPHACUS Braun, 1901b, 50, lapsus for Pronocephalus.

PRONOCEPHALIDÆ Looss, 1902m, 527, 580–617, 843 (includes: Charaxicephalus Looss, type robustus; Pyelosomum Looss, type cochlear; Cricocephalus Looss, type albus; Epibathra Looss, type crassa; Adenogaster Looss, type serialis; Pronocephalus Looss, type obliquus; Glyphicephalus Looss, type solidus; Pleurogonius Looss, type longiusculus), 611–612 (key to genera), 611 diagnosis.

PRONOCEPHALINÆ Looss, 1899b, 665, 668; 1902m, 841.—Braun, 1901b, 50, 53.—Pratt, 1902, 890, 909 (includes: Pronocephalus, Pleurogonius, Glyphicephalus, Adenogaster, Cricocephalus, Pyelosomum; related genus: Charaxicephalus).

PRONOCEPHALUS Looss, 1899b, 551, 666 (*ὁ πρών*=Vorsprung) (tod. "trigonocephalus Rud." [=obliquus, 1901]); 1901, 209; 1901, 567, 620; 1902m, 455, 531, 546, 551, 552, 570, 576, 583, 586, 594, 595, 596, 598, 599, 600, 603, 604, 609, 612, 615–616.—Braun, 1901b, 41.—Pratt, 1902, 890, 909.

1901: Pronocephacus Braun, 1901b, 50, misprint.

obliquus Looss, 1901, 30. Okt., 566–567 ("trigonocephalus (Rud.)" of Looss, 1899b, 666, 756, figs. 84–86); 1902m, 527–532, pl. 25, figs. 55–56; pl. 26, fig. 70; pl. 32, fig. 175; 616 (includes "Monost. trigonocephalum" of Braun, 1901, 40).

"*trigonocephalus* (Rud., 1809)" Looss, 1899b, 666, 756–759, 760, 761, 762, figs. 84, 85, 86; 1901, 566 (renamed obliquus); 1902m, 527 (syn. of P. obliquus), 549 (of Rudolphi to Pleurogonius), see Looss, 1901, 567.—Braun, 1901b, 38, 40.—Shipley, 1900, 533 (Rud.).

PRONOPHARYNX Cohn, 1904, 239–240 (tod. nematoides).

nematoides Cohn, 1904, 238–240, fig. 5 (in Aquila albicilla; Coll. Creplin).

PRONOPYGE Looss, 1899b, 641–642 (*ὁ πρών*=Vorsprung; *ἡ πύγη*=der Hintere) (tod. ocreata); 1902m, 839.—Luehe, 1901, 481, 485.—Pratt, 1902, 889, 906.

ocreata (Rud., 1802) Looss, 1899b, 641–642.—Luehe, 1901, 400, 481.—See Dist. carolinæ.

PROSORHYNCHUS Odhn., 1905, 296, 297–305 (tod. squamatus).

aculeatus Odhn., 1905, 297, 302, 305 (syns. Gasterost. crucibulum Ben., 1870; G. armatum Olss., 1876) (in Conger vulgaris; Mediterranean, Belgium, Sweden).

crucibulum (Rud., 1819) Odhn., 1905, 297, 305 (syns. Monost. crucibulum Rud.= Gasterost. armatum Mol.=G. crucibulum Olss.) (in Conger sp.; Mittelmeer, Sweden).

PROSORHYNCHUS—Continued.

squamatus Odhn., 1905, 297–304, 305, pl. 2, figs. 1–5 (syn. Gasterost. armatum Mol. of Levinsen) (in int. of Cottus scorpius; Belgium).—Nicoll, 1907, 70–71 (in Cottus bubalis, Liparis montagui).

PROSOSTOMATA Odhn., 1905, 305, suborder of Digenea to include all except the Gasterostomata (Gasterostomum, Prosorhynchus).

PROSOTOCUS Looss, 1899b, 616, 623 (*πρόσω*=cephalad; *ὁ τόκος*=das Gebären) (tod. confusus).—Pratt, 1902, 889, 902, 904.—Stiles, 1901, 197.

confusus (Looss, 1894) Looss, 1899b, 616.—Ssinitzin, 1905, 144–145; 1906, 687 (in Aeschna, Cordulia, and a beetle larva; Warschau).—Staff., 1905, Apr. 11, 684, 685.

tener (Looss, 1898) Looss, 1899b, 616.—Staff., 1905, Apr. 11, 684.

PROSTHOGOMINUS Jahresb. ü. d. Leist. a. d. Geb. d. Veterinär-Med., v. 21 (1901) 1902, 248 (misprint for Prosthogonimus).

PROSTHOGONIMUS Luehe, 1899k, 539 (tod. ovatus); 1900, 555; 1901, 487.—Braun, 1901f, 561; 1901i, 56; 1902b, 67, 68, 69, 80, 85, 96 (syn. Prymnoprion Looss).—Looss, 1900, 608; 1902m, 834, 835.—Pratt, 1902, 889, 901.—Stiles, 1901, 183, 185.

1899: Prymnoprion Looss, 1899b, 628 (tod. ovatum).

1902: Prosthogominus Jahresb. ü. d. Leist. a. d. Geb. d. Vet.-Med., v. 21 (1901), 1902, 248, misprint.

1903: Prostogonimus Markow, 1903, 287–294, 295–297, figs. 1–7; 1903b, Aug. 14, 538; 1905b, July, 54.

anatinus Markow, 1902, 1903a, 287–298 (Prostogonimus), pl. 1, figs. 1–7 (in Anas boschas dom.); 1903b, 538.

cuneatus (Rud., 1809) Braun, 1901, 15–16, 17, fig. 2; 1901, 258–259; 1902b, 75–79, 80, 81, 82, figs. 44–45 (syns. Fasc. ovata Rud. (part), Dist. ovatum Rud. of Wedl, 1858; of Linst., 1878; of Auct.; D. cuneatum Rud.; Prymnoprion anceps of Looss, in Machetes pugnax; P. ovatus of Looss in Passer domesticus).—Wolffhuegel, 1906, 21 Nov., 21–25 (in hen's egg).—Reported for Cygnus musicus, Corvus cornix, C. corone, Anas clangula, Fulica atra, Fringilla cœlebs, Grus cinerea, Otis tarda, Pavo cristatus.

japonicus Braun, 1901, 17, fig. 3 (in hen's egg; Yedo, Japan); 1901, 258; 1902b, 81, fig. 46.

ovatus (Rud., 1803) [Luehe, 1899k, 539] Braun, 1901, 13–15, 17, fig. 1; 1901, 258; 1902b, 17, 69, 75, 76, 77, 78, 81, 83, 84, fig. 43 (syns. Dist. ovatus Rud.; Fasc. ov. Rud.).—Kowal., 1902d, [8] 26.—Markow, 1902, 292, 297 (Prostogonimus).—Reported for Larus canus, Anas glacialis, Pica caudata, Corvus cornix, Sturnus vulgaris.—T. h. Corvus frugilegus.

pellucidus (Linst., 1873) [Luehe, 1899k] Braun, 1901, 16–17, 18; 1901, 258–259; 1902b, 79, 80, 81, 82, fig. 45a (in Numenius arquatus, Gallus domesticus).

rarus Braun, 1901, 17–19, fig. 4 (in Fulica atra, Coll. Berlin; Anas boschas); 1901, 258, 259 (in Anas clypeata); 1902b, 22, 83, 84, 85, figs. 47, 48 (labelled Dist. ovatum in Berlin Coll. nos. 1615, 1423).

PROSTHOMETRA Looss, 1896b, 58–60 (felineus type by inclusion), no specific combinations made, but following species included: Dist. geminum, simulans, amphileucum, complexum, choledochum, longissimum, crassiusculum, xanthosomum, felineum; 1901, 194.—Stiles, 1901, 183, 185.

PROSTOGONIMUS Markow, 1903, 287, for Prosthogonimus.

PROTENTERON Staff., 1904, May 3, 494 (m. diaphanum) (*πρῶτος*=first; *ἔντερον*=intestine).

diaphanum Staff., 1904, May 3, 494 (t. h. Ambloplites rupestris; Canada).

PRYMNOPRION Looss, 1899b, 628–629 (*πρυμνός*=the undermost part; *ὁ πρίων*=the saw) (tod. ovatus); 1900, 608; 1902m, 839.—Braun, 1901i, 56; 1902b, 67, 68 (syn. of Prosthogonimus).—Ofenheim, 1900, 182.

anceps Looss, 1899b, 629, 722–723, fig. 41 (in Machetes pugnax; Apr., Marg, Egypt).—Braun, 1901, 13, 16; 1902b, 68, 69, 78 (Looss from M. pug.; syn. of Prosthogonimus cuneatus).

ovatus (Rud., 1803) Looss, 1899b, 629, 720–722, 723, figs. 39–40 (in Passer domesticus; Alexandria and Cairo).—Braun, 1901, 16; 1902b, 73, 78 (Looss, from P. dom.; syn. of Prosthogonimus cuneatus).

pellucidus (Linst., 1873) Looss, 1899b, 629, 723.

PSEUDAXINE Par. & Perugia, 1890, 11-12, 19 (m. trachuri) (Microcotylidæ).—Braun, 1890a, 523, 540, 542, 546; 1893a, 890.—Gamb., 1896a, 73.—Mont., 1903, 336 (subf. Axininæ).—Pratt, 1900, 646, 653 (key), 657, fig. 41.

1879: Peudocotyle Tasch., 1879, 65, misprint.

trachuri Par. & Perugia, 1890, 11-12, pl. 14, figs. 10-13 (in Caranx trachurus; Genoa).—Braun, 1890a, 542, 549, 550 (in C. tr.; Mittelmeer, Genua).—Par., 1894, 595.—Pratt, 1900, 657, fig. 41.

PSEUDOCODYLE Tasch., 1879, 49, misprint for Pseudocotyle.

PSEUDOCOTYLE Ben. & Hesse, 1865a, 4th appendix, 11-18 (m. squatinæ), Tristomidæ.—Ben., 1868, 28.—Brand., 1891d, 20.—Braun, 1890a, 411, 442, 451, 453, 455, 478, 482, 483, 484, 491, 492, 498, 511, 516, 517, 518, 523, 530; 1891d, 422; 1893a, 890; 1896b, 7.—Cerf., 1898b, 347, 356, 362.—Fraip., 1880c, 445; 1881b, 28.—Gamb., 1896a, 73.—Haswell, 1892b, 150; 1893e, 112, 114.—Hoyle, 1890, 539.—Ijima, 1884c, 638.—Jackson, 1888, 644, 646, 647, 653.—Kerbert, 1881a, 544, 572.—Mont., 1888a, 10, 13, 16, 20, 34, 37, 42, 43, 52, 53, 55, 56, 57, 58, 59, 60, 65, 66, 67, 88, 98; 1892, 108, 127, 128, 129; 1892, Oct. 7, 213 (gen. of Monocotylidæ); 1893, 118; 1905, 69, 70 (=Microbothrium Olss.); 1903, 336 (subf. Pseudocotylinæ; f. Monocotylidæ).—Pratt, 1900, 646, 649 (key), 655, fig. 15.—St. Remy, 1891, 213, 214, 222.—Tasch., 1878, 176; 1878, 573; 1879, 65 (Peudocotyle), 49 (Pseudocodyle), 44, 49, 50, 54, 55, 58, 60, 62, 64, 65, 66, 68; 1879, 236 (syn. Microbothrium Olss.).

1879: Pseudocodyle Tasch., 1879, 49, misprint.

1879: Peudocotyle Tasch., 1879, 65, misprint.

apiculatum (Olss., 1868) Braun, 1890a, 530, 547, 550.—Mont., 1893, 206.—Staff., 1904, May 3, 482 (in Squalus acanthias; Canada).—Type of Microbothrium, 1869.—Reported also for Acanthias vulgaris.

fragile (Olss., 1868) Braun, 1890a, 530, 547, 551 (in Raja batis; Nordl. Eismeer).—Staff., 1904, May 3, 482 (syn. of Micropharynx parasitica Jægers., type of Mic).

minor Mont., 1888a, 16, 52, 60, 66 (in Scyllium); 1890, 191, fig. 4; 1891, 1892, 116, 127, 128; 1905, 70.—Braun, 1890a, 530, 547, 552 (in Sc. canicula; Mittelmeer, Naples).—Type of Leptocotyle 1905.

squalinæ Mont., 1892, 127, for squatinæ.

squatinæ Ben. & Hesse, 1865a, 4th appendix, 11-18, figs. 1-7 (in Squatina angelus; Ostende).—Ben., 1870, 13.—Brand., 1891d, 20.—Braun, 1889k, 622; 1890a, 420, 421, 424, 445, 449, 487, 530, 547, 552 (in Squat. ang.; North Sea, Mittelmeer, Naples); 1893b, 178.—Cerf., 1898b, 341.—Fraip., 1880c, 442.—Goto, 1891a, 162.—Ijima, 1884c, 638.—Juel, 1889, 36.—Kerbert, 1881a, 533.—Looss, 1885b, 5, 10.—Mont., 1888a, 7, 16, 19, 20, 23, 26, 32, 37, 39, 45, 52, 53, 66, 88; 1890, 420; 1892, 116, 127 (squalinæ), 128.—Par., 1894.—Pratt, 1900, 655, 657, fig. 15.—Tasch., 1878, 176; 1878, 573; 1879, 20; 1879, 48-55, 57, pl.3, fig. 2 (in Squat. ang.).—Ziegler, 1883, 545.

PSEUDOCOTYLINÆ Mont., 1903, 336 (f. Monocotylidæ); 1905, 69, 78.

PSEUDODISCUS Sons., 1895, 8 (for hawkesi, collinsi, ornatum), also written as subg.; 1895, 184, 185, 186; 1896, 310.—Fischder., 1903h, 489.—Piana & Stazzi, 1900, 523.

cobboldi Montgomery, 1906, Feb. 12, 21 (in ponies; India).

hawkesi (Cobbold, 1875) Sons. [1895, 5], 1896, 310.—Piana & Stazzi, 1900, 519 [=Amphist. hawkesi].

ornatum (Cobbold, 1882) [Sons., 1895, 5].

(PSEUDODISCUS) as subg. of Amphist.—Sons., 1895, 187.

collinsi Cobbold.—Sons., 1895, 9, fig. 2; 1895, 187, fig. 2.

haukesi Cobbold of Sons., 1895, 9, fig. 1.

hawkesi Cobbold, Sons., 1895, 187, fig. 1.

PSILOSTOMIDÆ Looss, 1900, 604.

PSILOSTOMINÆ Looss, 1900, 604.—Pratt, 1902, 888, 896 (includes: Psilost., Crepidostomum, Rhytidodes, Allocreadium, Calycodes, Azygia, Helicometra, Cotylotretus; related genera: Ptychogonimus, Orchipedum).

PSILOSTOMUM Looss, 1899b, 573-574, 578, 579 (ψιλός=kahl) (tod. platyurum); 1900, 603, 604.—Braun, 1900, 232; 1901a, 33; 1901i, 56; 1901, 944; 1902b, 11, 15, 18, 19, 26, 147, 148.—Luehe, 1900, 489.—Pratt, 1902, 888, 897.—Stiles, 1901, 189.

PSILOSTOMUM—Continued.

brevicolle (Crep., 1829) Braun, 1902b, 12–14, fig. 9 (syns.: Dist. brevicolle Crep., 1829, 24; Duj., 1845a, 445; Mueller, 1897, 19; D. (Dicrocœlium) brevicolle Stoss., 1892, 35).

oxyurum (Crep., 1825) Braun, 1902b, 14, fig. 10.

platyurum (Mueh., 1896) Looss, 1899b, 574.

redactum Nicoll, 1906, 515, 525–527, pl. 13, figs. 9–10 (in Gasterosteus aculeatus; Scotland); 1907, 70, 73 (syn. of Podocotyle atomon).

simillimum (Mueh., 1898) Looss, 1899b, 574.

spiculigerum (Mueh., 1898) Looss, 1899b, 574.—Braun, 1902b, 15, 16, 155.

PTACUNELLA Massa, 1906, 58, for Placunella.

PTEROCOTYLE Ben. & Hesse, 1863, 1864, 96, 106 (palmatum=inhærens, type by inclusion; also type because it is only species figured).—Braun, 1890a, 477, 498, 516, 517, 522, 546.—Cerf., 1895h, 918, 920; 1896, 514, 515, 516.—Mont., 1888a, 7, 11, 16, 36, 66, 86, 89, 99; 1903, 336 (syn. of Dactycotyle).—Scott, T., 1901, 149.—Tasch., 1879, 240.

morrhuæ Ben. & Hesse, 1863; 1864, 106–107 (in Gadus morrhua).—Braun, 1890a, 492.—Cerf., 1895h, 922; 1896, 517; 1898a, 302.—Scott, 1901, 149–150, pl. 8, figs. 25–26 (in Gadus callarias, G. merlangus); 1905, 118 (in Scott, 1901, pl. 8).—Tasch., 1879, 246 (syn. of Octobothrium morrhuæ).

palmata (Leuck., 1830) Ben. & Hesse, 1863, 1864, 107–108, pl. 11, figs. 1–13 (syns. Octobothrium pal. Leuck., Octodactylus inhærens Dalyell) (in Gadus molva).—Cerf., 1895h, 917 (syn. of Octob. pal.); 1896, 513.—Scott, 1901, 149, pl. 8, fig. 27 (in Molva molva); 1905, 118 (in Scott, 1901, pl. 8).—Tasch., 1879, 246 (to Octob.).

PTERONELLA Ben. & Hesse, 1863; 1864, 94–95 (m. molvæ), fam. Udonellidés.—Braun, 1890a, 410, 446, 511, 516, 517, 523, 531, 532; 1893a, 890.—Gamb., 1896a, 73.—Mont., 1888a, 10, 86, 88, 98; 1892, Oct. 7, 213 (gen. of Udonellinæ); 1903, 336 (subf. Udonellinæ).—Pratt, 1900, 646, 649 (key), 655, fig. 14.

molvæ Ben. & Hesse, 1863; 1864, 94–95, pl. 8, figs. 20–23 (in Lota molva).—Braun, 1890a, 409, 418, 532, 548, 550, 551 (in Lota molva; Atlantic Ocean).—Linst., 1889a.—Pratt, 1900, 655, 657, fig. 14.—Tasch., 1878, 573 (to Udonella).

PTYCHOGONIMUS Luehe, 1900, 489 (m. megastomus).—Looss, 1901, 206; 1902m, 829, 830.—Pratt, 1902, 888 (related to Psilostominæ), 897, 900.

megastomus (Rud., 1819) Luehe, 1900, 489; 1901, 483.—Fischder., 1903h, 548.

PYCNOPORUS Looss, 1899b, 551, 610–611, 612, 618, 619 (πυκνός=firm, thick, strong, because of acetabulum) (tod. heteroporus); 1901, 199, 200.—Pratt, 1902, 889, 903.—Staff., 1903, 828.—Stiles, 1901, 197.

"*acetabularis* Looss, 1896," for acetabulatus Looss, 1899, in Braun, 1900, 388.

acetabulatus Looss, 1899b, 611, 717–719, fig. 36 (in Vesperugo kuhli; Egypt); 1901, 205; 1907, Mar. 5, 481 (in Vesp. k.; Cairo, Egypt), 488.—Braun, 1900, 227, 228.

heteroporus (Duj., 1845a) Looss, 1899b, 611.—Braun, 1900, 227, 228.—Staff., 1905, Apr. 11, 692–693.

inversus Looss, 1907, Mar. 5, 486–487, figs. 6 a–b (in Vesperugo kuhli; Cairo, Egypt).

PYELOSOMUM Looss, 1899b, 667 (ἡ πύελος=Trog, Wanne, Mulde) (m. cochlear); 1902m, 581, 582, 584, 586, 590. 593, 597, 600, 601, 602, 609, 611, 612, 613 (diagnosis), 614.—Braun, 1901b, 50.—Pratt, 1902, 890, 910.

cochlear Looss, 1899b, 667, 773–774, fig. 83 (in Chelonia mydas; Egyptian coast); 1902m, 416, 578–580, pl. 27, figs. 102–104; pl. 32, fig. 181; 593, 613.—Braun, 1901a, 53.

PYGIDIOPSIS Looss, 1907, 488 (m. genata), Heterophyiden.

genata Looss, 1907, Mar. 5, 488–490, figs. 7 a–c (in Pelecanus onocrotalus; Cairo, Egypt).

PYGORCHIS Looss, 1899b, 587 (m. affixus) (ἡ πυγή=der Steiss).—Braun, 1902b, 31, 37.—Ofenheim, 1900, 182.—Pratt, 1902, 888, 898.

affixus Looss, 1899b, 587, 596, 702–703, fig. 25 (in Corvus cornix; Marg, Galiub, Gizeh, Cairo; Falco tinnunculus; Galiub; Circus æruginosus; Nil, Adeleninsel; Recurvirostra avocetta).—Braun, 1901, 948; 1902b, 147.

RAJONCHOCOTYLE Cerf., 1899a, 347, 373, 420, 440, 445, 446, 455–456 (type batis, designated by Cerf. in correspondence with Stiles, Jan. 21, 1907).—Mont., 1903, 336 (subf. Onchocotylinæ).

alba Cerf., 1899a, 377, 381, 383, 407, 408, 413, 417, 420, 433, 437, 438, 444, 446, 450, 463–464, pl. 18, figs. 5, 6, 8, pl. 19, fig. 9, pl. 20, figs. 1, 2, 3, 6, 7, pl. 21, figs. 1, 4, 8, 11, 13, 14, 15 (in Raja alba Lacep.).

batis Cerf., 1899a, 376, 381, 383, 442, 451, 462–463, pl. 19, figs. 11, 12, pl. 21, fig. 12 (syn. Onchocotyle appendiculata Olss., 1867 and 1876) (in Raja batis).

prenanti (St.-Remy, 1890), Cerf., 1899a, 377, 381, 383, 447, 464, pl. 18, figs. 10, 11, pl. 19, fig. 10, pl. 20, fig. 4 (syns. Onchocotyle appendiculata Kuhn of Sons., O. borealis Ben. of Stoss., 1885, O. prenanti St.-Remy, 1890) (in Raja oxyrhynchus).

REDIA Fil., 1837a, 336–337 (m. gracilis); 1854a, 6.—R. Bl., 1888a, 542, 551, 553, 554, 555, 556, 557, 558, 559, 604, 645.—Braun, 1892a, 775; 1893a, 884.—Burm., 1856a, 245.—Dies., 1850a, 287, 301; 1855a, 379 (cf. sporocerca), 380, 383, 393; 1858d, 240 (cf. sporotherium).—Goldb., 1855a, 16.—Hoyle, 1890, 535.—Jackson, 1888, 644, 651, 652, 653.—Pag., 1857, 10.—Wagener, 1866, in 145–150, figs. 1–11.—Ward, 1903, 863, 865.

gracilis Fil., 1837a, 336–337, figs. 6–7 (in Planorbis nitidus; Italy); 1854a, ——, pl. 1, fig. 4.—Dies., 1850a, 301; 1855a, 394 (syn. of Diplocotyle mutabilis).—Moul., 1856a, 95 (syn. of Cerc. diesingii), 106, 107 (syn. of Cerc. amphistomi subclavati).—Pag., 1857, 25.—Par., 1894, 165.

RENICOLA Cohn, 1904, 235 (tod. pinguis).

pinguis (Mehlis, 1846) Cohn, 1904, 232–235, figs. 2–3 (syn. Monost. pingue Mehlis, 1843; Braun, 1893a, 915, in Podiceps cristatus; Brand., 1892, 504–511).

RENIFER Pratt, 1902, 888, 899; 1903, 25 (tld. ellipticus).

ellipticus Pratt, 1903, 25–28, 29, 34, pl. 4, fig. 1 (in Heterodon platyrhinus; North America).—Staff., 1905, Apr. 11, 691.

elongatus Pratt, 1903, 25, 28–30, pl. 4, fig. 2 (in Heterodon platyrhinus; North America).—Seely, 1906, 253.—Staff., 1905, Apr. 11, 691 (thinks this a Lechriorchis).

solitarius (Looss, 1899) Pratt, 1903, 25.

variabilis (Leidy, 1856) Pratt, 1903, 25, 31–34, pl. 4, fig. 5.

zschokkei (Volz, 1899) Pratt, 1903, 25, 28.

RENIFERINÆ Pratt, 1902, 888 (contains Styphlodora, Ochetosoma, Renifer, Oistosomum, Astiotrema).

RHIPIDOCOTYLE Dies., 1858e, 313, 361–362 (type probably gracilescens).—Hausmann, 1897b, 34.—Mont., 1888, 92.—Odhn., 1905, 296.—Ziegler, 1883, 538.

grascilescens (Rud., 1819) Dies., 1858e, 361 (in Lophius piscatorius; Apr., Triest; Mar., Pisa).—Linst., 1878a, 223 (includes Monost. isabellinum Ratzell).—Stoss., 1898, 61.—Tennent, 1906, 638.—Reported also for Lota molva, Merlangus vulgaris, Gadus æglefinus, G. melanostomus.

minima (Wagener, 1852) Dies., 1858e, 361–362 (in Trigla microlepidota).—Linst., 1878a, 227.—Tennent, 1906, 638 (minimum).

RHOPALIADÆ Looss, 1899b, 543.

RHOPALIADINÆ Braun, 1901.—Looss, 1902m, 839.

RHOPALIAS Stiles & Hass., 1898a, 82, 93, 96 (=Rhopalophorus Dies., 1850a [not Ropalophorus Westwood, 1840, hymenopteron; not Rhopalophorus Agassiz, 1846, Rhopalophora Serv., 1834] renamed) (tod. coronatus).—Braun, 1900, 28; 1900d, 27–29; 1901e, 318, 320, 324, 326–329 (syn. Rhopalophorus); 1903, v. 2, 23.—Looss, 1899b, 542, 581.—Pratt, 1902, 888 (related to Echinostominæ), 894.

baculifer Braun, 1900d, 28 (in Didelphys palmata; Brazil); 1901e, 325–326, pl. 19, fig. 1.

coronatus (Rud., 1819) Stiles & Hass., 1898a, 93.—Braun, 1900, 28, 29; 1901e, 320–323, 324, 326, 328, pls. 19, 20, figs. 2, 4, 11 (syns. Dist. cor. Rud., Rhopalophorus cor. Dies., Echinost. cor. Stoss).—Reported for Didelphys cancrivorus, D. nudicaudata, D. palmata, D. quica, D. virginiana.

horridus (Dies., 1850a, 400) Stiles & Hass., 1898a, 93. Braun, 1901e, 323, 325, pl. 19, fig. 3 (syns. Dist. coronatum; Rhopalophorus horr. Dies.).—Reported for Didelphys nudicaudata, D. philander.

RHOPALOCERA Fil., 1854a, 6 (for Rhopalocerca).—Burm., 1856a, 250.

RHOPALOCERCA Dies., 1850a, 286, 293 (m. tardigrada=Dist. duplicatum renamed); 1855a, 379, 384; 1858d, 270.—Burm., 1856a, 250 (Rhopalocera).—Fil., 1854a, 6 (Rhopalocera).—Goldb., 1855a, 15.—Moul., 1856a, 121, 123.

tardigrada Dies., 1850a, 293–294 (Dist. duplicatum Baer, 1827b, renamed); 1855a, 378, 380, 384 (in Anodonta ventricosa, A. anatina); 1858d, 241, 242, 271–272 (syns. Dist. dup. Baer, Cerc. dup. Moul.) (in Anodonta ventricosa; Regiomontii; A. anatina, A. cygnea).—Jacobson, ——, 301, pl. 8, figs. 1–4 (syn. Dist. dup.).—Leidy, (1858) 1859, 110; 1877, 202.—Looss, 1894a, 63.—Pag., 1857, 6.—Ziegler, 1883, 540.

RHOPALOPHORUS Dies., 1850a, 288, 400 (not Ropalophorus Westwood, 1840; not Rhopalophorus Agassiz, 1846, for Ropalophorus, 1840; not Rhopalophora Serv., 1834) (tld. coronatus); 1855, 172; 1858e, 312, 357.—Braun, 1892a, 568, 569, 576, 595; 1893a, 879, 880, 886, 890, 893, 895, 908, 911, 918; 1900, 28; 1900h, 3; 1901e, 318, 319.—Carus, 1863, 479.—Gamb., 1896a, 73.—Goldb., 1855a, 17; 1899b, 536, 538, 542.—Mont., 1888a, 8, 11, 92, 105; 1892, Oct. 7, 214 (gen. of Distominæ); 1893, 82, 153, 154, 155.—Stiles, 1901, 172.—Stiles & Hass., 1898a, 93 (renamed Rhopalias, type coronatus).

coronatus (Rud., 1819a) Dies., 1850a, 400; 1855, 172–173, pl. 1, figs. 6–11; 1858e, 357.—Braun, 1893a, 911 (in Didelphys cancrivorus, D. myosurus, D. palmata, D. quica; Brazil); 1901e, 319, 320, 323, 324, 325.—Cobbold, 1879b, 432.—Kaiser, 1893a, 93.—Mont., 1893, 83.

horridus Dies., 1850a, 400 (in Didelphys myosurus, D. philander; Brazil); 1855, 173, pl. 1, figs. 12–16; 1858e, 357.—Braun, 1892a, 583; 1893, 911 (in Did. my., D. phil.; Brazil); 1901e, 319, 320, 323, 324.—Cobbold, 1879b, 432.—Mont., 1893, 83.—Stiles & Hass., 1898a, 93.

RHYTIDODES Looss, 1901l, 565 (tod. gelatinosus); 1902m, 451 (diagnosis), 839.—Odhn., 1905, 296.—Pratt, 1902, 888, 897.

gelatinosus (Rud., 1819) Looss, 1901l, 563–565 (in Thalassochelys corticata Looss; Egypt); 1902m, 414, 416, 441, 445–456 (includes: Dist. gelat. Rud., 1819a, 386; Sons., 1890, 43; 1893; Stoss., 1898, 43; Braun, 1899, 716; 1901, 9, figs. 6, 12, pl. 1, fig. 9, pl. 2; Looss, 1899b, 579), 458, 460, 462, 463, 870, pl. 22, figs. 19–24.—Heymann, 1905, 82, 83, 87.

SACCOCŒLIUM Looss, 1902h, 134, 135 (tod. obesum).

obesum Looss, 1902h, 135, 140–141, 142, figs. 9–11 (in Mugil auratus, M. cephalus, M. chelo; Triest).

tensum Looss, 1902h, 141–142, figs. 12–13 (in Mugil chelo; Triest).

SAPHEDERA Looss, 1902m, 732, 839 (Macrodera, 1899, renamed) (type naja).—Staff., 1905, Apr. 11, 691.

1899: Macrodera Looss, 1899b, 603 (tod. naja) [not Macroderes ante 1882].

naja (Rud., 1819) Looss, 1902m, 732.

SCAPHANOCEPHALUS Jægers., 1903a, 1–16 (m. expansus), σκαπάνη=Spaten; κεφαλή=head.

expansus (Crep., 1842) Jægers., 1903a, 1–16, pl. 1, figs. 1–5 (in Pandion haliaëtus; Tor on Red Sea); 1904a, 279; 1904, 16 pp., 1 pl., 3 figs., Distomidæ.

SCAPHIOSTOMUM Braun, 1901g, 897 (m. illatabile); 1902b, 129, 133, 134.—Pratt, 1902, 889, 907 (key).

illatabile Braun, 1901g, 897 (in Falco nitidus Lath.; Brazil); 1902b, 134–136, fig. 80.

SCHISOSTOMA Colloridi, 1891a, 854, for Schistosoma.

SCHISTOMOSUM Cummins & Dupaquier, 1907, Jan., 496, for Schistosoma.

SCHISTOSOMA Weinland, 1858 [prior to Sept. 30], 58, 87 (m. hæmatobium) (not Schistosoma Brady, 1877, arachn.).—R. Bl., 1895, 730 (Schistosomum).—Braun, 1893a, 894, 912; 1901, 562; 1901, 947; 1902b (Schistosomum), 140, 142, 144; 1903, 3 ed., 168; 1906, 176 (syns. Gynæcophorus, Bilharzia, Thecosoma).—Catto, 1904, 1499.—Christopher, 1905, Aug. 15, 259 (a peculiar egg of).—Christopher & Stephens, 1905, Nov. 11, 1289 (peculiar egg); 1905, 2341; 1905, Nov. 30, 1944; 1905, Aug. 26, 609.—Cobbold, 1879b, 39; 1885a, 498 (syn. of Bilharzia).—Colloridi, 1891a, 854 (Schisostoma).—Darr, 1902, 660.—Huber, 1896, 580 (syn. of Bilharzia hæmatobia).—Katsurada, 1904b, 1237–1249 (Japanese); 1904c, 298–305 (Japanese); 1904, 160; 1904e (schistosomiasis in Japan); 1904g, Oct. 31, 126–134; Nov. 30, 135–148 (schistosomiasis in Japan); 1905a, Jan., 14–15.—Leuck., 1863a, 617.—Looss, 1895, 3; 1899b, 543, 656, 657, 658–659.—Moniez, 1896, 154–155.—Montgomery, 1906, 15–46, 2 pls.; 1906, Feb.

SCHISTOSOMA—Continued.

12, 18, 21 (Schistosumum).—Mont., 1896, 163.—Poche, 1907, 126.—Pratt, 1902, 889, 907.—Scheube, 1905, 150–155; 1905, 29 Aug., 1701.—Simon, 1897, 99.—Stiles, 1898a, 23, 27, 58, 63; 1903, 77.—Stiles & Hass., 1898a, 90, 93–94, 95, 98 (syns. Gynæcophorus, Bilharzia, Thecosoma) (type Dist. hæmotobium).—Ward, 1903, 224; 1903, 871–872.

1858: Gynæcophorus Dies., 1858, 356 (hæmatobius) later than Oct. 21, 1858.

1859: Bilharzia Cobbold, 1859, 364 (hæmatobia).

1860: Thecosoma Moquin-Tandon, 1860, 342 (hæmatobium).

1877: Bilhartzia Sons., 1877, 652 for Bilharzia.

1891: Schisostoma Colloridi, 1891a, 854, misprint.

1895: Schistosomum R. Bl., 1895, 40, for Schistosoma.

1905: Schistostoma Schwarz, 1905, 31 Mar., 236, misprint.

1906: Schistosumum Montgomery, 1906, Feb. 12, 21, misprint.

1907: Schistomosum Cummins & Dupaquier, 1907, Jan., 496.

bomfordi Montgomery, 1906, 143–147, pl. 1, figs. 1–4, pl. 2, fig. 1 (in Bos indicus; India).

bovis (Sons., 1876) R. Bl., 1895b, 101–104, fig. 7.—Braun, 1902b, 143 (syn. Bilharzia crassa).—Gomy, 1897a, 377.—Looss, 1905m, 281.—Moniez, 1896, 154.—Montgomery, 1906, Feb. 12, 17 (in cattle; Egypt; in sheep, Sicily), 18, 19, 43, 44; 1906, 138 (syns. Bilh. cr., B. bovis).—Rail., 1899, 788.—Stiles, 1898a, 23, 58, 60, 61, 62, 140, figs. 45, 46, 47.

cattoi R. Bl., in Catto [1904, Sept., 17, 663; 1904, Oct. 8, 710; 1904, Sept. 29, 1480; 1904, Nov., 15; 1904, Nov. 19, 1411; 1904, Nov. 26, 1499;] 1905, Jan. 7, 70–73, 9 figs. (in Homo); 1905, Jan. 7, 11–13, figs. 1–9 (in Homo; Prov. of Fukien, China); 1905, Jan. 28, 202; 1905, Jan. 19, 114; 1905, Mar. 1, 70–74; 1905, Mar. 31, 236; 1905, 179–189; 1906, Jan. 5, 617.—Brit. Med. J., Lond., 1905, v. 1, 27–28.—Crimp, 1905, Jan. 1, 67–68 (pathology); 1906, Apr. 22, 219.—Looss, 1905, 94; 1905m, 280.—J. Trop. Med., Lond., 1905, Apr. 1, 105.—Montgomery, 1906, Feb. 12, 18 (syn. of S. japonicum), 19.—Scheube, 1905, Apr., 150–155.—Stiles, 1905q, 821–823 (syn. of japonicum); 1905s, 1809; 1905t, 827.

crassum (Sons., 1877) Looss, 1899b, 657, 658.

hæmatobium (Bilharz, 1852) Weinland, 1858, 87; 1859, 281.—R. Bl., 1888a, 636 (syn. of Bilharzia hæmat.); 1895, 740–744, fig. 80; 1895, 40–101, figs. 2–6; 1900, 488.—Bourel-Roncier, 1888a, 101ff.—Braun, 1902b, 144; 1906, 176–181, figs. 109–113 (syns. Dist. hæm., D. capense), 285.—Catto, 1904, 73; 1905, 71, 72; 1905, Jan. 7, 12.—Darr. 1902, 678.—Higgins, 1906, Mar. 24, 881–882 (in Canal Zone).—Katsurada, 1904, Dec., 148, 149, 150, 153, 154, 155, 156, 157.—Kowal., 1904, (10), 25 (in Homo; Kair).—Letulle, 1905e, 329–439, pls. 1–2, figs. 1–16; 1905c, 607–609.—Looss, 1896b, 158; 1899b, 657, 658, 751, 752; 1901, 27; 1905m, 281, 282, 284.—Moniez, 1896, 86, 154, 155–173, fig. 29; 1896, 86, to (Bilharzia).—Mont., 1896, 162, to (Bilharzia).—Montgomery, 1906, 139; 1906, Feb. 12, 16, 18, 31, 36, 40, 41, 43.—Rail., 1899, 787.—Roger, 1901, 94, 95.—Shaw, 1901, 1027.—Shipley, 1905, v. 6 (1), 4.—Stiles, 1898a, 23, 57, 58, 59, 60, 137, 138, 140, figs. 41, 42, 43, 44, 48; 1902, 40; 1902, 204; 1903, 8, 84.—Ward, 1895, 253 (syn. of Gynæcophorus hæmatobius), 328 (in Homo); 1903, 407; 1903, 863, 864, 872 (syns. Dist. hæm., Gynæcophorus hæm., Bilh. hæm., Thecosoma hæm., Bilh. capensis).—Yamagiwa, 1905, v. 6 (3), 2 pls.

indicum Montgomery, 1906, 139; 1906, Feb. 12, 44, 45 (in donkey; India).

japonicum Katsurada, 1904e, Aug. 3, 21 (in Felis catus dom. and Homo; Japan); 1904f, Dec., 147–160, pl. 7, figs. 1–10 (in Felis domestica; Homo; Japan, Prov. of Yamanishi); 1904b, 1237–1249; 1904c, 298–305; 1904d, 1–22; 1904g, 126–134, 135–148; 1905a, 14–15; 1905, Jan. 31, 236; 1905, Apr. 1, 108–111.—Beyer, 1905, Sept. 10, 578–579 (case in Asia); 1905, 4 pp.—Braun, 1906, 181–186, figs. 114–117 (syn. Sch. cattoi).—[Catto, 1904, Sept. 19, 1411.]—Inouye, 1903, 131–132.—[Kurimoto, 1893, 20 Nov.]—Logan, 1905, v. 19, 243–245 (Hunan Province); 1906, Oct. 1, 294–296, figs. 1–3.—Looss, 1905m, 280–285; 1905n, 1362; 1906, Feb., 31; 1906, May 1, 132.—Montgomery, 1906, 140; 1906, Feb. 12, 18 (man and cat), 19, 40, 43, 44 (syn. S. cattoi).—Scheube, 1905, Apr., 150–155.—Stiles, 1905q, 821–823 (syn. cattoi); 1905r, 7 pp.; 1905s, 1809; 1905t, 827; 1905bb, 854 (in Philippines); 1905, v. 39 (3), 280–285.—Woolley, 1906, 83–89, 3 pls., figs. 1–5 (in Philippines); 1906, Feb., 32–35; 1906, Apr. 21, 260; 1906, July 16, 530–531.

SCHISTOSOMA—Continued.

kowalewskii (Par. & Ariola, 1896) Rail., 1899, 788, to Bilharziella by Looss, 1899b.

magnum (Cobbold, 1859) Rail., 1899, 788.—Looss, 1899b, 658.

mansoni Sambon, 1907, June, 365–366 (in Homo; Africa).

polonicum (Kowal., 1895) Rail., 1898, 412; 1899, 788.—Looss, 1899b, 658, type of Bilharziella.—Reported for Anas boschas, A. boschas dom., A. acuta, A. crecca, A. querquedula, Ardea cinerea, Mergus albellus.

[*reflexum* a term in teratology; it has no status in nomenclature.]

spindalis Montgomery, 1906, 147–150, pl. 2, fig. 2 (in Bos indicus; India).

SCHISTOSOMIASIS Toyama, 1905 (X, 26), 1739, medical term, name of the disease.—Miura, 1905a; 1906a, 46.—See also Bilharziosis.

SCHISTOSOMIDÆ Looss, 1899b, 542, 543, 659 (type Schistosoma; contains also Kœllikeria, Bilharziella).—Braun, 1903, 3. ed., 168; 1906, 176.—Catto, 1905, (I, 7), 13.—Luehe, 1901, 488.—Montgomery, 1906, Feb. 12, 18, 19.—Pratt, 1902, 889, 907 (genera: Schistosoma, Bilharziella, Kœllikeria).—Shipley, 1905, v. 6 (1), 4.—Ward, 1903, 864, 865.

SCHISTOSOMINÆ Stiles & Hass., 1898a, 90, 94, 95, 98.—Looss, 1901, 196.—Luehe, 1901, 175.—Stiles, 1898a, 22, 23, 58.

SCHISTOSOMUM R. Bl., 1895, 40, for Schistosoma, q. v.

SCHISTOSTOMA Schwarz, 1905, 31 Mar., 236, misprint for Schistosoma.

SCHISTOSUMUM Montgomery, 1906, Feb. 12, 21 (for Schistosoma).

SCHISTURUS Rud., 1809a, 8, 31 (m. paradoxus), 32; 1810a, 257–258.—Audouin, 1829, 408.—Blainv., 1824a, 513 "genre fort douteux établi par M. Rudolphi sur un animal incomplètement décrit par Redi".—Deslongchamps, 1824uu, 674; 1829b, 238.—Dies., 1850a, 331 (syn. Distomum).—Looss, 1899b, 527, 528; 1902m, 721, 764, 765, 778.—Luehe, 1900, 492.—Stiles, 1901, 195, 196.—Stiles & Hass., 1898a, 92, 94 (?syn. of Podocotyle).

paradoxus Rud., 1810a, 257–258, pl. 12, fig. 4 (in Tetrodon mola; Europe); 1819a, 118 (syn. of Dist. nigroflavum).—Audouin, 1829, 408.—Dies., 1850a, 394 (syn. of D. nig., in Orthragoriscus mola; Naples).—Looss, 1899b, 528; 1902m, 721, 764.—Luehe, 1900, 492.—Stiles, 1901, 196.—Stiles & Hass., 1898a, 92, 93.

(SCHIZOCERCA) subg. of Cercaria.—Dies., 1858d, 264–265.

dichotoma (Mueller, 1855) Dies., 1858d, 265 (free; Nice).

fissicauda (La Valette, 1855) Dies., 1858d, 265 (in Lymnæus stagnalis; Berlin).

gracilis (La Valette, 1855) Dies., 1858d, 264–265 (in Planorbis corneus; Berlin).

SINISTROPORUS Staff., 1904, May 3, 484–485 (tld. simplex designated in letter from Staff.); sinister, left; πόρος = pore.

productus Staff., 1904, May 3, 485 (in Hemitripterus americanus; Canada) (productus, lengthened).

simplex (Rud., 1809) Staff., 1904, 484–485 (in Acanthocottus scorpius, Gasterosteus aculeatus, Hemitripterus americanus, Phycis chuss, Salmo salar, Scomber scombrus, Sebastes marinus).

SODALIS Kowal., 1902d, 27 (m. spathulatus), 28 (10).

spathulatus (Rud., 1819) Kowal., 1902, 27 (9).

SOLENOCERCA Dies., 1855a, 380, 383 "Der abgeworfene Sporenschwanz ist zuweilen von einem Schlauche oder einer Röhre durchgezogen (Solenocerca, —— Redia Filippi)."

SOLENOCOTYLE Dies., 1850a, 289, 420 (m. chiajei); 1858c, 314, 374.—Ben. & Hesse, 1864, 84.—Braun, 1890a, 518.—Goldb., 1855a, 19.—Mont., 1888a, 89.

chiajæ Tasch., 1879, 251, for chiajei.

chiajeæ Mont., 1888a, 89, for chiajei.

chiajei Dies., 1850a, 420 (Polyst. loliginis Chiaje, 1823, renamed) (in Loligo vulgaris; Naples); 1858c, 374.—Mont., 1888a, 89 (chiajeæ) Tasch., 1879, 251 (chiajæ).

SPATHIDIUM Looss, 1899b, 605 (ἡ σπάθη = spade) (tod. folium) [not Spathidium Duj., 1841a]; 1900, 605; 1901b, 202, 222 (Phyllodist.); 1902m, 476.—Braun, 1901b, 9.—Odhn., 1902, 65.—Osborn, 1903, 257 (syn. of Phyllodist. Braun, 1899).

cymbiforme (Rud., 1819) Looss, 1899b, 605.—Type of Plesiochorus 1901.

folium (Olfers, 1816) Looss, 1899b, 605.—See also Rhopalocerca.

patellare (Sturges, 1897) Looss, 1899b, 605.

SPBYRANURA Mont., 1888a, 11 (for Sphyranura).

SPECIES.—Looss, 1902, 779–794, variation of and conception of, among trematodes.

SPELOTREMA Jægers., 1901b, Dec. 31, 982 (tod. pygmæum); 1903a, 14, 15.—Looss, 1902m, 706, 824 (type pygmæum).

claviforme (Brand., 1888) Nicoll, 1907, 247, 248, 249, 254–256 (in Aegialitis hiaticula, Pelidna (Tringa) alpina).

excellens Nicoll, 1907, 247, 248–251, 252, 253 (syn. S. simile Jægers.) (in Larus argentatus).

feriatum Nicoll, 1907, 247, 248, 251–253 (in Aegialitis hiaticula, Hæmatopus ostralegus, Pelidna (Tringa) alpina, Totanus calidris, Vanellus vanellus).

pygmæum (Levin., 1881) Looss, 1902m, 785, 786, 809, 854.—Nicoll, 1907, 247, 248, 249, 250, 251, 253, 254, 255, 256 (in Oidemia fusca, O. nigra).—Odhn., 1905, 314–318, figs. 1, 2 (syns. Dist. pyg., Levinsenia pyg.) (in Larus sp.; west coast of Sweden).

simile (Jægers., 1900) Looss, 1902m, 706, 786, [809], 854.—Nicoll, 1906, 522 (similis) (to Levinsenia).—Odhn., 1905, 315, 316, 317, fig. 2b.

similis Nicoll, 1906, 522 (to Levinsenia), for simile.

SPHÆROSTOMA Rud., 1809a, 38, 39 (type by virtual tautonymy globiporum) [nec Sperosoma Kœler; nec Sphærodoma Keyes).—Darr, 1902, 655, 661.—Looss, 1899b, 527, 571, 595, 646, 647, 648–649; 1902m, 757, 758, 769, 830, 831.—Stiles, 1901, 167, 179, 188, 191, 192, 193, 194, 195, 200.—Stiles & Hass., 1898a, 94–95, 97 (type globiporum=bramæ).—Stoss., 1902, 582.

1902: Sphærostomum Looss, 1899b, 648, for Sphærostoma.

globiporum (Rud., 1802) Looss, 1899b, 595, 649; 1902m, 654, 747, 765.—Ssinitzin, 1905, 113–121; 1906, 685 (larva is Cerc. micrura).—Stiles, 1901, 194.

SPHÆROSTOMUM Looss, 1899b, 648–649 (for Sphærostoma Rud.).

SPHYRAMURA Mont., 1888a, 36 (for Sphyranura).

SPHYRANNRA Mont., 1888a, 49 (for Sphyranura).

SPHYRANURA R. Wright, 1879, 15–20, pl. 1, figs. 12–14, 54–75 (m. osleri).—Bettend., 1897a, 8, 38; 1897, 312, 342.—Brand., 1891d, 15; 1898a, 214 [22].—Braun, 1889k, 622; 1890a, 413, 415, 433, 434, 435, 437, 440, 442, 445, 451, 453, 457, 462, 463, 466, 469, 470, 481, 482, 483, 487, 491, 492, 511, 517, 523, 538, 540, 546; 1893a, 890.—Gamb., 1896a, 56, 73.—Goto, 1891c, 103.—Haswell, 1892a, 458, 460; 1892b, 149; 1893e, 112, 113, 114, 144, 145.—Hoyle, 1890, 539.—Lander, 1904a, 16, 17.—Looss, 1894, 23, 24; 1894a, 136, 203.—Mont., 1888a, 10, 11 (Spbyranura), 15, 16, 23, 34, 36 (Sphyramura), 37, 46, 47, 48, 49, 50, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 64, 65, 66, 67, 89, 100; 1892, Oct. 7, 213 (gen. of Polystominæ); 1893, 18, 39, 41, 111, 118; 1903, 336 (subf. Dicotylinæ).—Pratt, 1900, 646, 651, 656, 659, fig. 22 (Spyranura).

1888: Spbyranura Mont., 1888a, 11, misprint.

1888: Sphyrannra Mont., 1888a, 49, misprint.

1888: Sphyramura Mont., 1888a, 36, misprint.

osleri R. Wright, 1879, 66–71, pl. 1, figs. 13–14, in Necturus (Mesobranchus) lateralis; ? Canada.—Braun, 1890a, 410, 418, 422, 424, 425, 430, 449, 454, 456, 468, 490, 540, 548, 552; 1891a, 53.—Crety, 1893a, 384.—Goto, 1891a, 160.—Haswell, 1892b, 150, 151; 1893e, 97, 99, 115.—Kowal., 1898h, 158 (55).—Lander, 1904a, 16.—Looss, 1894, 21; 1894a, 234.—Mont., 1888a, 8, 13 (oslerii), 20 (Spyranura), 25, 26, 27, 29, 32, 34, 35, 37, 39, 41, 44, 47, 48, 49 (Sphyrannra), 56; 1891, 1892, 99, 104; 1893, 16, 39, 112.—Pratt, 1900, 656, 657, 659 (key) (Spyranura), fig. 22.—Staff., 1900, 405; 1905, 682 (in Necturus maculatus Raf.; Canada). Wright & Macallum, 1887, 1–48, pls. 1–48.

oslerii Mont., 1888a, 8, 13, for osleri.

SPOROCERCA Dies., 1855a, 379–380, "Der abgeworfene Schwanz der Cercarieen ist somit ein Sporenbehälter, welcher von Baer als *Sporocystis*, von Siebold als *Keimschlauch*, von Steenstrup als *Amme*, von Beneden als *Scolex* and von Filippi als *Redia* beschrieben und abgebildet wurde. Ich werde mich in der Folge dafür des Collectivnamens Sporenschwanz (*Sporocerca*) bedienen."

SPOROCYSTIDES Baer.—Dies., 1858d, 240, 242.

SPOROCYSTIS Baer.—Braun, 1892a, 775.—Burm., 1856a, 245.—Dies., 1855a, 379 (cf. sporocerca); 1858d, 270 (cf. sporonema).—Fil., 1854a, 6.—Pag., 1857, 10.—Wagener, 1866, in 145–150, figs. 1–11.

SPOROCYSTOPHORA Fil., 1856.

SPOROCYSTOPHORÆ Fil., ——.—Dies., 1858d, 240, 242.

SPORONEMA Dies., 1855a, 380, "Bei allen zwei schwänzigen [Cercaria] hingegen wächst die Spitze des Sporenschwanzes in eine fadenförmige unverästelte oder verästelte Röhre aus, welche stellenweise in Knoten oder Kugeln anschwillt, die neue Brut in allen Graden der Entwickelung einschliesst, und endlich auch selbst vom Sporenschwanze abfällt (Sporonema)"; 1858d, 270 (cf. Sporocystis).

SPORONEMATA Dies., 1858d, 240.—See Sporonema.

SPOROTHERIUM Dies., 1858d, 240 (i. e. Redia Fil.).

SPYRANURA Mont., 1888a, 20, for Sphyranura.

SQUALONCHOCOTYLE Cerf., 1899a, 347, 373, 420, 440, 445, 446, 454–455, 456 (type borealis, designated by Cerf. in correspondence with Stiles, Jan. 21, 1907).—Mont., 1903, 336 (subf. Onchocotylinæ).

abbreviata (Olss., 1876) Cerf., 1899a, 375, 380, 382, 460, pl. 19, fig. 3 (syn. Onchocotyle abbreviata Olss.) (in Acanthias vulgaris; Roscoff).

borealis (Ben., 1853) Cerf., 1899a, 374, 379–380, 382, 421, 422, 423, 424, 427, 428, 431, 433, 434, 436, 443, 444, 446, 456–457, pl. 18, fig. 13, pl. 19, fig. 7, pl. 20, figs. 13, 14, pl. 21, fig. 16 (syn. Onchocotyle borealis Ben.) (in Scymnus borealis; Liége).—Odhn., 1905, 372 (syn. Onchoc. bor. Ben.).

canis Cerf., 1899a, 375, 380, 382, 398, 406, 410, 433, 443, 447, 450, 458–459, pl. 18, figs. 1, 2, 7, 12, pl. 19, fig. 2, pl. 20, fig. 12, pl. 21, figs. 2, 6, 10 (in Galeus canis; Roscoff).

grisea Cerf., 1899a, 376, 381, 383, 461, pl. 19, fig. 8 (syn. Onchocotyle appendiculata Tasch., 1879) (in Hexanchus griseus).

spinacis (Goto, 1894) Cerf., 1899a, 376, 380–381, 383, 404, 417, 419, 424, 460–461, pl. 19, fig. 4 (syn. Onchocotyle spinacis Goto) (in Spinax sp.).

vulgaris Cerf., 1899a, 375, 379, 382, 403, 406, 409, 419, 427, 437, 438, 444, 446, 450, 457–458, pl. 18, figs. 3, 4, 9, pl. 19, fig. 1, pl. 20, figs. 5, 8–11, pl. 21, figs. 3, 5, 7, 9 (syns. Polyst. appendiculatum of Thaer, 1850; Onchocotyle emarginata of Sons., 1890) (in Mustela vulgaris).

STEGANODERMA Staff., 1904, May 3, 486–487 (m. formosum) (στεγανός=covered).

formosum Staff., 1904, May 3, 486–487 (t. h. Hippoglossus hippoglossus; Canada.) (formosus, well formed).

STENAKRON Staff., 1904, May 3, 487 (m. vetustum) (στενός=narrow; ἄκρον=end).

vetustum Staff., 1904, May 3, 487 (in Hippoglossus hippoglossus; Hemitripterus americanus), based on Linton, 1901, 485, pl. 32, fig. 359, pl. 33, figs. 360–362, in Limanda ferruginea; Woods Hole) (vetustus old).

STENOCOLLUM Staff., 1904, May 3, 487 (m. fragile); στενός, narrow; collum, neck.

fragile (Lint., 1900) Staff., 1904, 487 (in Mola mola).

STEPHANOCHASMUS Looss, 1900, Dec. 3, 603 (=Stephanostomum Looss, 1899 [not Stephanostoma Danielson & Koren] renamed, hence type cesticillus); 1901b, 199; 1901e, 595, 597–605, 628, 629, 634, 654–661; 1901f; 1902g; 1902m, 441, 780, 808, 838.—Braun, 1901a, 34; 1902b, 30.—Odhn., 1902, 37; 1902, 155, 159; 1905, 331.—Pratt, 1902, 888, 895.

1899: Stephanostomum Looss, 1899b, 576 (tod. cesticillus), not Stephanostoma Danielson, 1880, worm.

baccutus Nicoll, 1907, 72, 80–83, pl. 2, figs. 5–7 (in Hippoglossus vulgaris; Scotland).

bicoronatus (Stoss., 1883) Looss, 1901e, 599–601, 604, fig. 2 (in Umbrina cirrhosa, Corvina nigra).

caducus Looss, 1901e, 603–604, fig. 4 (in Gadus minutus, Lophius piscatorius; apparently Triest).—Nicoll, 1907, 81.

cesticillus (Mol., 1858) Looss, 1901e, 598–599, 601, 604, fig. 1 (in Lophius piscatorius).—Nicoll, 1907, 80, 81, 82, 83.

histrix (Dies., 1850, for hystrix Duj., 1845) Staff., 1904, May 3, 485 (on fins of Pseudopleuronectes americanus Walb., and in cysts free in stomach of Lophius piscatorius containing 2 partially digested Limanda ferruginea).

minutus Looss, 1901e, 604–605 (in Uranoscopus scaber; apparently Triest).—Nicoll, 1907, 83.

pristis (Delongchamps, 1824) Looss, 1901e, 601–603, 604–605, figs. 3, 5 (in Gadus euxinus, G. minutus, Motella vulgaris).—Nicoll, 1907, 80.

sobrinus (Levin., 1881) Staff., 1904, May 3, 485 (in rectum of Hemitripterus americanus, Cryptacanthodes americanus, Lycodes sp.; Canada.)—Odhn., 1905, 331 (syn. Dist. sobrinum).

STEPHANOPHARYNX Fischder., 1901, 370 (m. compactus): 1902a, 24; 1903h, 492 (Paramphistominæ), 551.—Looss, 1902m, 835.—Pratt, 1902, 887, 892.—Shipley, 1905, v. 6 (1), 8.

compactus Fischder., 1901, 370 (in Bos taurus): 1902a, 24–26, fig. 2 (in Bos taurus; Africa); 1903h, 493, 496, 566, 567, 584.

STEPHANOPRORA Odhn., 1902, 22–24 (m. ornata), fig. 1.—Pratt, 1902, 888, 895 (key).

ornata Odhn., 1902, 22–24, fig. 1 (in Nilkrokodil).

STEPHANOSTOMUM Looss, 1899b, 576–577, 579, 582, 583, 590, 596 (tod. cesticillus) [not Stephanostoma Danielsen, 1880, Vermes), ὁ στέφανος, Stirnkrone, Kranz; 1900, 603 (renamed Stephanochasmus); 1901, 595.—Braun, 1901b, 34; 1901i, 55.—Luehe, 1900, 489.—Rud., 1801a, 58.—Stiles, 1901, 189.

cesticillus (Mol., 1858) Looss, 1899b, 576, 582, 696–698, figs. 21–22 (in Lophius piscatorius; Naples).

hystrix (Duj. of Olss.) Looss, 1899b, 576, 582.

lydæ (Stoss., 1896) Looss, 1899b, 576, 582.—Type of Dihemistephanus 1901.

pristis (Deslongchamps, 1824) Looss, 1899b, 576, 582, 697.

sobrinum (Levin., 1881) Looss, 1899b, 576, 582.

STERELMINTHA Owen, 1835, 390.—Aitken, 1872, 146, 178–207; 1874, 57.—Baird, 1853a, 39 (pars=Trematoda).—Dunglison, 1893, 820, 1039.—Mont., 1888a, 84.—Sieb., 1839, 153.—Tasch., 1879, 234.

STERINGOPHORUS Odhn., 1905, 309 (tod. furciger).

furciger (Olss., 1868) Odhn., 1905, 301, 305–310, pl. 2, figs. 6–7 (in Pleuronectes limanda and Drepanopsetta platessoides; on Swedish west coast; Cottus scorpius, Gymnocanthus ventralis, Lycodes pallidus; East Greenland).—Nicoll, 1907, 72, 183 (in Pleuronectes limanda).

STERRHURINAE Looss, 1907, 599–600, subf. of Hemiuridæ, contains: 1. Sterrhurus, 2. Lecithochirium, 3. Synaptobothrium, 4. Plerurus.

STERRHURUS Looss, 1907, 600 (tod. musculus).

fusiformis (Luehe, 1901) Looss, 1907, 602 (in Conger conger).

grandiporus (Rud., 1819) Looss, 1907, 601–602 (in Muræna helena; Naples).

imocavus Looss, 1907, 601 (in Thynnus sp. (? thunnina); Alexandria, Egypt).

musculus Looss, 1907, 600–601 (in Anguilla vulgaris, Dentex vulgaris; Triest; also in Acipenser sturio, Gadus euxinus, Gobius jozo, Labrax lupus, Lichia amia, Lophius piscatorius, Ophidium barbatum, Pagellus erythrinus, Rhombus maximus, Serranus cabrilla, Trachinus draco; Triest).

STICHOCOLYLE Mont., 1892, Oct. 7, 176, for Stichocotyle.

STICHOCOTOLYLE Mont., 1888a, 9, for Stichocotyle.

nephropis (Cunningham, 1884) Mont., 1888a, 9, for Stichocotyle nephropis.

STICHOCOTYLE Cunningham, 1884a, July 12, 399 (m. nephropis); 1887a, 273–280, figs. 1–6.—Brand., 1898a, 213 [21].—Braun, 1892, 47; 1892a, 571, 581, 660, 672; 1893a, 892.—Hoyle, 1890, 539.—Jackson, 1888, 645, 646.—Mont., 1888a, 16, 31, 32, 42, 43, 44, 45, 46, 47, 91, 107; 1892, Oct. 7, 176, 196, 198; 1893, 20, 36, 37.—Nickerson, 1901, Mar. 8, 378 (Aspidobothridæ); 1902, 603, 604, 607, 609, 610, 612, 614, 615, 616, 617.—Odhn., 1902, 44, 45.—Pratt, 1902, 887, 891.

1888: Stichocotolyle Mont., 1888a, 9, misprint.

1892: Stichocolyle Mont., 1892, 176, misprint.

nephropis Cunningham, 1884a, 399 (in Nephrops norvegicus; Firth of Forth); 1887a, 273–280, pl. 39, figs. 1–6.—Braun, 1892a, 571.—Jackson, 1888, 642.—Jægers., 1899, 202.—Mont., 1888a, 9 (Stichocotolyle), 12, 26, 38, 39, 80, 89; 1893, 36, 48.—Nickerson, 1895, 447–480, pls. 29–31 (in American lobster); 1895, 634–635; 1902, 614, 617 (in Raja sp.; Europe, N. America).—Odhn., 1898, 509–513 (sexual form).—Rossbach, 1906, 374.

(STICHORCHIS) Fischder., 1901, 373 (tod. giganteus), subg. of Cladorchis: 1902a, 41 (type giganteum).—Looss, 1902m, 836.—MacCallum, 1905b, 668.

giganteus (Dies., 1836d) Fischder., 1901, 373; 1902a, 41–42, 43 (in Dicotyles albirostris, D. torquatus).

subtriquetrus (Rud., 1814) Fischder., 1901, 373–374; 1902a, 35, 42–43 (syns. Amphist. subtriquetrum Rud., Dist. amphistomoides Boj.) (in Castor fiber); 1903h, 567.

STICHORCHIS (Fischder., 1901) Looss, 1902m, 439.

subtriquetrus (Rud., 1814) Looss, 1902m, 439.

STICTODORA Looss, 1899b, 671–672 (m. sawakinensis), στικτός, punctuate; ἡ δορά, skin; 1902m, 442.—Pratt, 1902, 890, 910.

sawakinensis Looss, 1899b, 672, 754–755, fig. 90 (in Laurus sp.; Sawakin, Egypt, Jan.).

STOMYLOTREMA Looss, 1900, Dec. 3, 602 (=Stomylus Looss, 1899 [not Fæhr., 1871] renamed) (type singulare=perpastum).—Braun, 1901, 260; 1901, 896; 1902b, 85, 86, 91 (syn. Stomylus) (type S. perpastum Braun=singulare Mol. of Looss).—Odhn., 1902, 38.

1902: Stromplotrema Zool. Rec., 1902 (1901), v. 38, 53, Vermes, misprint.

bijugum Braun, 1901g, 896 (in Himantopus melanopterus Mey.; Brazil); 1902b, 91, fig. 53.

fastosum Braun, 1901g, 896 (in Caprimulgus sp., Squatarola helvetica; Brazil); 1902b, 90, fig. 52.

perpastum Braun, 1902b, 86, 88 (syn. Stomylus singularis of Looss, not Dist. singulare Mol.).

pictum (Crep., 1837) Braun, 1901, 896; 1902b, 86 (syns. Dist. pictum Crep., 1837, 313, 316; D. singulare Mol., 1861, 200).

[*singulare* (Mol., 1861, of Looss)].

tagax Braun, 1901g, 896 (in Hirundo versicolor Natt.; Brazil); 1902b, 90, fig. 51.

vicarium Braun, 1901, 896 (in Ibis cœrulescens Vieill.; Brazil); 1902b, 89, 90, fig. 1.

STOMYLUS Looss, 1899b, 629–630 (m. singularis) (στωμύλος=Der ein gutes Mundwerk hat) [nec Stomylus Fåhræus, 1871, coleopteron]; 1900, Dec. 3, 602 (renamed Stomylotrema).—Braun, 1902b, 85, 86, fig. 49 (syn. of Stomylotrema).

singularis (Mol., 1861, of Looss) Looss, 1899b, 596, 630, 723–725, figs. 42–43 (in Glareola prantincola; Dachschur).—Braun, 1901, 260; 1901, 896; 1902b, 86, 88 (syns. Stomylotrema perpastum, not Dist. singulare Mol.).

STRIGEA Abildg., 1790a, 37, pl. 5, a–c (m. strigis), mentions only Gœze, 1782a, 174, pl. 14, figs. 4–6 (=strigis).—Baird, 1853 (=Holost. macrocephalum).—Brand., 1888a, 9.—Braun, 1893a, 884, 894, 902.—Cuv., 1817, 41.—Deslongchamps, 1824yy, 701; 1829e, 677.—Dies., 1850a, 307 (syn. Hemist. Dies.), 312 (syn. of Holost. variabile).—Fischder., 1901, 367; 1902a, 6 (renamed Amphistoma by Rud.), 7 (m. strigis Gœze, 1782a,=Amphist. macrocephalum Rud., 1809, =Holost. macrocephalum Nitzsch, 1819) ("if again made valid=Holost., while Amphist. must receive a new name"); 1903h, 487, 490.—Linst., 1905, 191.—Looss, 1902m, 438, 439, 746, 756.—Luehe, 1901, 175.—Rud., 1801a, 59; 1809a, 21.—Shipley, 1905, v. 6 (1), 7 (type Holost. macr.).

1801: Amphistoma Rud., 1801a, 50 (Strigea renamed).

1819: Holostomum Nitzsch, 1819, 399–401, type by inclusion variabile=strigis.

anatis tadornæ Viborg, 1795, 196.—Dies., 1850a, 313 (syn. of Holost. erraticum).—Rud., 1809a, 352 (to Amphist.).

candida Mueller (or Abildg.), 1806a, v. 4, 32, pl. 143, fig. C, 1–2.—Dies., 1850a, 313 (syn. of Holost. erraticum).—Olfers, 1816, 48.—Rud., 1814a, 100 (renamed Amphist. isostomum).

cervi (Schrank, 1790) Rail., 1893a, 376.—Stiles, 1898a, 64.

falconis palumbi Viborg, 1795, 243.—Baird, 1853a, 47 (=Holost. macrocephalum).—Dies., 1850a, 309 (syn. of Hemist. spathula).—Rud., 1809a, 352 (to Amphist.).

longicollis (Duj. [Rud., 1819]) Luehe, 1905, 215 (syns. Echinorhynchus gazæ, Gmelin, Zed.; E. ardeæ albæ Rud.; E. sp. Mueller).

STROMPLOTREMA Zool. Rec., 1902 (1901), v. 38, 53 Vermes, for Stomylotrema.

STYPHLODORA Looss, 1899b, 592, 593, 594, 633 (tod. serrata) (στυφλός=rough; ἡ δορά=skin); 1901, 560; 1902m, 505, 506, 507 (diagnosis), 512, 514, 821.—Cohn, 1902, 882.—Odhn., 1902, 27, 40, 42.—Pratt, 1902, 888, 899.

1902: Styphlodera Looss, 1902m, 872, misprint.

serrata Looss, 1899b, 592, 707–708, 709, fig. 28 (in Varanus niloticus; Zool. Inst., Leipzig).—Luehe, 1900, 561.

solitaria Looss, 1899b, 592, 708–709, fig. 29 (in Thalassochelys corticata; Abukir); 1902m, 505, 506–507, 511, 517, 872, pl. 24, fig. 40.—Luehe, 1900, 560, 561.—Pratt, 1903, 25 (Styphlodera), 33, to (Renifer).

SUBCLAVATA Gœze, 1782, 41, 169, 178–179 (a "Klasse" of Plan. Gœze, 1782, containing Fasc. subclavata Pallas).

SYNAPTOBOTHRIUM Linst., 1904, 254 (m. copulans).—Odhn., 1906, 59–66, figs. 1–2 (syn. of Lecithochirium Luehe, 1901, 473).

caudiporum (Rud., 1819) Looss, 1907, 604 (in Zeus faber; Triest; also in Caranx trachurus, Lophius piscatorius, Platessa passer, Rhombus lævis, R. maximus, Scomber colias; Triest).

copulans Linst., 1904, 254, figs. 1–4 (in Arnoglosus laterna; ?Louvain); 1906, 751.—Odhn., 1906, Apr. 3, 59–66, figs. 1–2 (to Lecithochirium).

SYNCŒLIINÆ Looss, 1899b, 544, 642, 645, 646; 1901, 208 (includes: Syncœlium, Progonus, Otiotrema).—Fuhrmann, 1904, 61 (Syncoliinæ).—Odhn., 1905, 366.—Pratt, 1902, 889, 905 (includes: Progonus, Syncœlium, Otiotrema; related genera Halipegus, Accacœlium, Eurycœlum).

1904: Syncoliinæ Fuhrmann, 1904, 61, for Syncœliinæ.

SYNCŒLIUM Looss, 1899b, 643–644, 645, 646 or 647, 741, 742, 743 (m. ragazzii); 1901, 208, 209, 210; 1902m, 642, 813.—Braun, 1902b, 23.—Fuhrmann, 1904, 61.—Luehe, 1901, 481, 482, 486.—Odhn., 1905, 366.—Ofenheim, 1900, 160.—Pratt, 1902, 889, 905.

ragazzii (Setti, 1897) Looss, 1899b, 644, 731–736, 737, 738, 743, 746, figs. 50, 62, 63–68 (in Lamna sp.; Sawakin).—Darr, 1902, 661.—Luehe, 1901, 481.

SYNCOLIINÆ, see Syncœliinæ.

TAPHROGONIMUS Cohn, 1904, 235–237 (m. holostomoides).

holostomoides (Mehlis, 1846) Cohn, 1904, 235–237 (syn. Monostomum pingue Crep., 1843; Braun, 1893a, 915; Brand., 1892, 504–511).—Reported for Podiceps cristatus.

(TAXORCHIS) Fischder., 1901a, 373 (tod. schistocotyle); 1902a, 39–40; 1903h, 498.—Looss, 1902m, 836 (as genus).

schistocotyle Fischder., 1901a, 373 (in Dicotyles torquatus); 1902a, 40–41 (syn. Amphist. giganteum Dies., e. p.).

TELORCHIINÆ Looss, 1899b, 569.—Braun, 1901b, 20.—Pratt, 1902, 888, 895 (includes Telorchis, Orchidasmus; related genus Deropristis).

TELORCHIS Looss, 1899b, 566–569, 614 (tod. linstowi=? aculeatus); τηλοῦ, τῆλε, in der Ferne; ὄρχις, testes; 1900, 608.—Braun, 1900, 234.—Stiles, 1901, 183, 185.—See also D. ercolanii, D. poirieri, D. nematoides, D. arrectum.

TELORCHIS Luehe, 1899, 529, 530 (tod. clava); 1900, 556, 566; 1901, 488.—Braun, 1900, 390; 1901b, 13, 14, 17, 19, 20, 21, 26, 30, 34; 1901i, 56, 58.—Looss, 1901, 207; 1902m, 824, 831, 832, 834, 839.—Pratt, 1902, 888, 895.

aculeatus (Linst., 1879) Braun, 1901b, 14–17 (syn. Dist. linstowi Stoss.), 19, fig. 4.—Stoss., 1904, 4, 5, 6, 8 (in Testudo græca; Albania).

arrectus (Duj. of Mol., 1859) Stoss., 1904, 9 (in Podarcis muralis; Italy).

augustus Staff., 1905, Apr. 11, 690 (in Chrysemys picta; Canada), misprint for angustum (Dist.), 1900.

bifurcus (Braun, 1899) Braun, 1901, 18–19, 30, fig. 2.—Heymann, 1905, 95 to (Cercorchis).—Stoss., 1904, 9 (Testuggini d'acqua dolce; Brazil).

clava (Dies., 1850) Luehe, [1899, 529;] 1900, 566.—Looss, 1900, 608; 1901, 207; 1902m, 831.—Odhn., 1900, 17.—Stoss., 1904, 9 (in Eunectus scytale; Brazil).

ercolanii (Mont., 1893) Braun, 1901b, 16.—Rizzo, 1902, 28 (syn. Dist. monticelli) (in Tropidonotus natrix; Catania).—Stoss., 1904, 4, 5–6 (syn. T. nematoides) (syn. Dist. ercolanii) (in Trop. nat., T. viperinus; Italy).

linstowi (Stoss., 1890) Looss, 1899b, 566 (type of Telorchis Looss, not Luehe).—Braun, 1901b, 14 (syn. of aculeatus).—Luehe, 1900, 566 to (Cercorchis, type).—Stoss., 1904, 3, 4.

nematoides (Mueh., 1898) [Luehe, 1899, 529.—] Braun, 1901b, 16.—Looss, 1899b, 567.—Odhn., 1900, 17.—Stoss., 1904, 4, 6 (syn. T. ercolanii) (in Tropidonotus natrix; Germany).

parvus Braun, 1901b, 19–20, fig. 3 (in Testudo orbicularis; Vien. Mus.).—Heymann, 1905, 95, to (Cercorchis).—Stoss., 1904, 9 (in Cistudo lutaria).

pleroticus (Braun, 1901) Braun, 1901b, 17–18, fig. 5.—Heymann, 1905, 95, to (Cercorchis).—Stoss., 1904, 9 (in Testuggini d'acqua dolce; Brazil).

poirieri (Stoss., 1895) Odhn., 1902, 31.—Heymann, 1905, 95, to (Cercorchis).—Stoss., 1904, 3–5, fig. 2 (syns. Dist. gelatinosum Rud. of Poir., 1885, D. poirieri) (in Cistudo lutaria; Italy and France; in Emys orbicularis; Sassari, Sardegna).

solivagus Odhn., 1902, 29–32, fig. 2 (in Clemmys caspica).—Stoss., 1904, 9 (in Cl. casp.; Caucasia).

TELORCHIS (CERCORCHIS) Heymann, 1905, 94, sp. (in Dermatemys mavii).

TEMNACEPHALE Cosmovici, 1887a, 127 (for Temnocephala).

TEMNOCEPHALA E. Bl., 1849, 51–52 (m. chilensis).—Bettend., 1897a, 8; 1897, 312.—R. Bl., 1888, 137, 138 (m. chilensis) (on écrevisse; Chili), g. of Branchiobdellides.—Brand., 1891d, 13, 24, 27, 28, 29.—Braun, 1889k, 620, 621; 1890a, 408, 412, 422, 424, 425, 429, 430, 435, 436, 437, 440, 442, 444, 445, 447, 451, 456, 458, 461, 465, 466, 468, 469, 470, 471, 472, 475, 479, 481, 482, 485, 490, 491, 497, 499, 510, 511, 512, 517, 520, 521, 522, 523, 525, 1890b, 84–90, 125–128; 1890e, 595; 1893a, 889; 1893b, 179; 1895b, 25; 1906, 129.—Buttel-Reepen, 1900a, 590.—Chilton, 1888, 252; 1889a, 252–253 (on crayfish in New Zealand).—Cosmovici, 1887a, 127 (Temnacephale).—Darr, 1902, 649, 678.—Gamb., 1896a, 4, 56, 73.—Graff, 1903.—Haswell, 1887a, 279–302, pls. 20–22; 1888a, 50–51; 1888, 279–302; 1892a, 457ff; 1892b, 149–151; 1892c, 486; 1892d, 360–362 (integument); 1893, 455–460; 1893c, 342; 1893d, 477; 1893e, 93ff; 1893f, 153, 154, 155, 156; 1894, 93–152.—Kathariner, 1894a, 132, 134.—Looss, 1894a, 219; 1895, 36.—Maclaren, 1904, 582, 601.—Mont., 1888a, 10, 15, 17, 18, 22, 27, 33, 34, 35, 36, 38, 39, 42, 43, 44, 45, 47, 48, 49, 50 (Temuocephala), 51, 52, 53, 54, 56, 57, 58, 64, 66, 67, 86, 88, 98, 110; 1889b, 4pp., 3 figs.; 1891, 1892, 100, 108, 109, 110, 128, 129,: 1892, Oct. 7, 186, 213 cg. of Temnocephalidæ); 1893, 8, 9, 114, 211; 1899, 72–122 (107 Temoncephala); 1905f, 21–24, 2 figs. (in Sesarma gracilipes; New Guinea); 1905h, 402–403.—Plate, ——, 187–191.—Pratt, 1900a, 646, 647 (key), 658.—Roewer, 1906, 207, fig. 4.—St.-Remy, 1898, 522, 524–525.—Schuberg, 1895, 180.—Semper, 1872, 304.—Vayssiere, 1892, July 4, 64–65; 23 pp., 1 pl. (on Astacoides madagascariensis); 1894, 16 Mar., 389.—Wacke, 1902, 34 pp.; 1903, 12 May, in 1–116, pls. 1–9, figs. 1–75; 1903, Aug., 2481; 1903, 17 Oct., 17–18; 1904, 17 May, 281; 1905, July, 64.—Weber, 1889, 1–20, 3 pls.

1887: *Temnacephale* Cosmovici, 1887a, 127 (for Temnocephala).

1888: *Temuocephala* Mont., 1888a, 50 (for Temnocephala).

1889: *Temoncephala* Mont., 1889, 107, misprint.

aurantiaca Haswell, 1900, 431, 433, pl. 22, fig. 3 (in Astacopsis sp.).

axenos Mont., 1898, ——; 1899, 83, 84, 101, 102, 103, 104, 112, 114, 120, pl. 3, figs. 9, 10 (host not known; Brazil).—Cerf., 1899a, 448.

bifasciata Haswell.—Mont., 1889, 2.

brevicornis Mont., 1889, 1–4, figs. 1–3 (in Hydromedusa maximiliani, Hydraspis radiolata; Brazil (syn. Pentadion emydum Kroyer MS.); 1892, 110; 1893, 8, 114; 1899, 72–127, 2 pls.; 1899, 72–122, pl. 3, figs. 1–8, 11–18, pl. 4, figs. 19–33 (in Hy. draspis gibba; Brazil; Hydromedusa maximiliani, H. tectifera); 1903, 2.—Brand., 1891d, 21, 24, 25.—Braun, 1890a, 525, 547, 552.—Cerf., 1899a, 448.—Haswell, 1892d, 361; 1893e, 94, 103, 104, 105, 112, 141 (in Hydrom. maxim., Brazil; Hydropsis radiolata); 1900, 433, 434.—St.-Remy, 1898, 528.

cæca Haswell, 1900b, 432, 433, pl. 22, fig. 4 (in Phreatoicopsis n. sp.; Victoria).

chilensis (Moquin-Tandon) E. Bl., 1849, 51–52, pl. 2, fig. 6 ("en las branquias de los cangregos de Chile").—Braun, 1890a, 499, 525, 547, 549; 1891d, 421.—Cerf., 1899a, 448.—Haswell, 1887a, 279, 284 (of Gay); 1893e, 96, 131, 140 (in Æglea; Chile).—Mason, 1875a, 336–337.—Mont., 1888a, 88 (of Blainv.); 1889, 2; 1889q, 125–133, figs. 1–13; 1889r, 9 pp., 13 figs.; 1891, 1892, 128, 129; 1890a, 500–501; 1891g, 44–45; 1892, Oct. 7, 186; 1893, 114; 1899, 72, 73, 76, 78, 79, 80, 81, 83, 84, 85, 93, 101, 102, 107, 108, 109, 111–113 (chilinsis), 114, 120 (in Æglea lævis; Chile) (of Moquin-Tandon); 1899, 125–133, figs. 1–13; 1899, 9 pp.; 1903, 2.—Philippi, 1870, 35–40.—Plate, 1894, 686–687; ——, 529–531; 1897, 213.—St.-Remy, 1898, 525.—Wacke, 1903, May 12, in 1–116, 9 pls., 14 figs.; 1903, 17 Oct., 17–18; 1905, July, 64.—Wood, 1875, 336–337.

chilinsis Mont., 1899, 113, for chilensis.

comes Haswell, 1893e, 96, 98, 100, 123, 134, 138, pl. 13, figs. 15, 16 (in Astacopsis serratus); 1900, 433.—Mont., 1899, 83, 110, 114, 121 (in Ast. serr.; Australia, N. S. Wales).—St.-Remy, 1898, 525.

dendyi Haswell, 1893e, 96, 97, 98, 99, 100, 102, 105, 111, 115, 116, 122, 123, 124, 125, 126, 130, 135–136, 144, pl. 10, figs. 8, 12, 17, 18, pl. 11, figs. 5, 6, pl. 12, figs. 7, 11, pl. 13, figs. 1–11 (in Astacopsis bicarinatus); 1900, 433.—Mont., 1899, 83, 84, 93, 110, 114, 121 (in Ast. bic.; Australia, N. S. Wales, Victoria).—St.-Remy, 1898, 527.

digitata Mont., 1903a, 309 (in Palemonetes argentinus); 1903, 3; 1905g, July, 64.

TEMNOCEPHALA—Continued.

engæi Haswell, 1893e, 97, 124, 139–140, pl 13, fig. 20 (in Engæus fossor; Gippsland).—Mont., 1899, 83, 114, 121 (in Engeus fossor; Australia, Gippsland) (engei).—St.-Remy, 1898, 528.

engei Mont., 1899, 83, 114, 121 (for engæi).

fasciata Haswell, 1887a, 284, 285, 293, 296, pl. 20, figs. 1,2, pl. 21, figs. 1–7, 9–13, pl. 22, figs. 1–7, 11–18 (in Astacopsis serratus; N. S. Wales) (286, fasciatus); 1888a, 50 (in Ast. serr.; N. S. W.); 1892d, 361; 1893e, 96, 98, 99, 100, 102, 104, 106, 107, 109, 110, 111, 115, 118, 119, 121, 122, 123, 124, 126, 131, 133–134, 135, 136, 137, 138, pl. 10, figs. 1–3, 5, 6, 13, 14, 15, 16, pl. 11, fig. 2, 3, 4. 7, 8, 9, pl. 12, figs. 1, 3, 4, 5, 6, pl. 13, figs. 12–14, pl. 14, fig. 1 (Asta. serr.): 1900, 433, pl. 22, fig. 5.—Brand., 1891d, 24.—Braun, 1890a, 409, 422, 465, 525, 547, 549.—Mont., 1888a, 53, 88; 1891, 1892, 129; 1893, 114, 1899, 83, 92, 93, 97, 99, 102, 103, 110, 114, 120 (in Ast. serr.; Australia, N. S. Wales).—St.-Remy, 1898, 525, 527.

fasciatus Haswell, 1887a, 286, for fasciata.

jheringhii Mont., 1899, 79, 83, 84, 85, 109, 111, 112, 114, 120 (for jheringii).

jheringii Haswell, 1893e, 96, 100, 102, 112, 113, 121, 130, 137–138, 140, pl. 13, fig. 19, pl. 15, fig. 2 (in Ampullaria; Brazil).—Cerf., 1899a, 448.—Mont., 1899, 79, 83, 84, 85, 109, 111, 112, 114, 120 (jheringhii) (in Ampullaria sp.; Brazil).—St.-Remy, 1898, 527–528.

madagascariensis Vayssière (1892), 64–65; 1894.—Braun, 1893b, 183.—Cerf., 1899a, 449.—Haswell, 1893e, 141 (in Astacoides madagascariensis).—Mont., 1899, 76, 79, 82, 83, 91, 93, 101, 103, 114, 115–116.—St.-Remy, 1898, 528–529 (on Ast. mad.; Madagascar).

mexicana Vayssière, 1898, 227–235, 1 pl. (on Cambarus digneti); 1898, 17–25, pl. 11. Cerf., 1899a, 448. Mont., 1899, 79, 83, 85, 101, 103, 106, 114, 120 (in Camb. dig.; Mexico.—Pratt, 1900a, 655, 657, 658 (key), fig. 1.

microdactyla Mont., 1903b, 1–3; 1905b, Jan. 31, 22 (in Dilocarcinus septemdentatus; Matto Grosso).

minor Haswell, 1887a, 284, 285, 296, pl. 20, fig. 4, pl. 21, fig. 8, pl. 22, fig. 9 (in Astacopsis bicarinatus; N. S. W.); 1888a, 50 (in Ast. bicar.; N. S. W.); 1893e, 95, 96, 98, 99, 100, 101, 102, 109, 110, 116, 121, 123, 126, 131, 134, 135, 136, 137, 139, 141, 142, 144, pl. 12, figs. 2, 8, 9, pl. 15, fig. 1 (in Asta. bicari.); 1900, 433.—Braun, 1890a, 525, 547, 549.—Mont., 1888a, 53, 88; 1889, 3; 1899, 83, 93, 99, 101, 110, 114, 120 (in Ast. bicar.; Australia, N. S. Wales, Victoria).—St.-Remy, 1898, 526–527, 528, 529.

novæ zealandiæ Haswell, 1888a, 50, for novæ zelandiæ.

novæ-zelandiæ Haswell, 1887a, 284, 293, 296, 298, pl. 22, figs. 10, 19 (in Paranephrops setosus; New Zealand); 1888a, 50 (in Para. setosus; N. Zea.) (novæ zealandiæ); 1892a, 459; 1893e, 96, 97, 98, 99, 100, 109, 110, 115, 116, 121, 130, 131, 138–139, 145, pl. 10, figs. 4, 7, 11, pl. 11, fig. 1, pl. 13, figs. 17, 18, pl. 14, figs. 2, 3 (in Para. neozealanicus, P. planifrons; New Zealand); 1900, 433.—Braun, 1890a, 525, 547, 550.—Gamb., 1896a, 54, figs. 20, 21.—Maclaren, 1904, 582, 583, 596.—Mont., 1888a, 98; 1889, 3; 1899, 83, 86, 92, 101, 103, 105, 109, 110, 114, 121 (in Para. novæ-zelandicus, P. setosus; New Zealand).—St.-Remy, 1898, 526 (novæ-zealandiæ).—Wacke, 1903, 12 May, 1–116; 1903, 17 Oct., 17–18; 1905, July, 64.—Ziegler, 1905, 40, fig. 4 (after Wacke, 1903).

quadricornis Haswell, 1887a, 284, 296, pl. 20, fig. 3, pl. 22, fig. 8 (in Astacopsis franklinii; Tasmania); 1888a, 50 (in Asta. frank.; Tasmania); 1893e, 96, 98, 100, 101, 102, 109, 110, 120, 121, 124, 131, 136–137, pl. 12, fig. 10, pl. 14, fig. 4 (in Asta. frank.; Tasm.); 1900, 433.—Braun, 1890a, 409, 525, 547, 549.—Mont., 1888a, 10, 53, 88; 1889, 3; 1899, 83, 101, 114, 117, 120 (in Asta. frank.; Australia, Tasmania).—St.-Remy, 1898, 526.

semperi Weber, 1889, —— .—Braun, 1890a, 461, 466, 499, 525, 547, 550; 1890b, 126; 1898a, 1567.—Cerf., 1899a, 449.—Haswell, 1892a, 458; 1893e, 96, 97, 98, 99, 102, 112, 113, 115, 119, 122, 123, 128, 129, 130, 131, 138, 140 (in Philippines); 1900, 433.—Mont., 1891, 1892, 129 (semperii); 1893, 114; 1899, 73, 76, 77, 78, 79, 82, 83, 87, 91, 96, 99, 102, 103, 107, 108, 109, 112, 114, 121 (in Telphusa sp.; Filippine, Sonda).—St.-Remy, 1898, 528.

semperii Mont., 1892, 129, for semperi.

tasmanica Haswell, 1900, 430-431, 433, pl. 22, figs. 1–2 (in Astacopsis tasmanicus).

tumbesiana Wacke, 1903, 12 May, 1-116; 1903, 17 Oct., 17–18; 1905, July, 64.

TEMNOCEPHALÆ Mont., 1888a, 19, 88, 96, for Temnocephaleæ.

TEMNOCEPHALEÆ Haswell, 1892a, 457–460; 1893b, 191; 1893e, 93–152 (monograph); 1893f, 153, 154, 155, 157; 1894b, 256; 1900, 430–435, 1 pl. (Temnocephalæ).—Braun, 1890a, 517, 520, 523, 524.—Cerf., 1894, 946, 948; 1898b, 361.—Mont., 1888a, 19, 88, 96 (Temnocephalæ), 7, 9, 10, 11, 13, 15, 16, 17, 18, 19, 20 (Tenmocephaleæ), 22, 23, 26, 27, 28, 29, 31, 34, 36, 41 (Temnocepholeæ), 42, 47, 52, 55, 59, 64, 67, 86, 88, 98, 108, 110.

TEMNOCEPHALIDÆ Haswell, 1888.—Braun, 1890a, 524; 1893a, 889.—Gamb., 1896, 53–55, 73.—Mont., 1888a, 25, 27; 1892, Oct. 7, 213 (fam. of Eterocotylea; contains Temnocephala); 1899, 116–122.—Pratt, 1900a, 646 (Temnocephalinæ, Actinodactynellinæ) 647 (key).—St.-Remy, 1898, 522, 524.

TEMNOCEPHALINÆ Mont., 1899, 118, 119.—Pratt, 1900a, 646 (Temnocephala, Craspedella, Dactylocephala), 647 (key).

TEMNOCEPHALOIDEA Mont., 1905, 403.

TEMNOCEPHOLEÆ Mont., 1888a, 41 (for Temnocephaleæ).

TENMOCEPHALEÆ Mont., 1888a, 20 (for Temnocephaleæ).

TERES SEU CYLINDRICA Gœze, 1782a, 41, 169, 173–176 (a "Klasse" of Planaria Gœze containing two "Gattungen": 1. Gattung, simpliciporo, der Entenplattwurm, Weideeulewurm; 2. Gattung, duplici poro, Iltis-Plattwurm, Dachs-Plattwurm).

TERGESTIA Stoss., 1899, 11, 16 (type probably acanthocephala).—Braun, 1901b, 34.—Looss, 1899b, 580.—Pratt, 1902a, 888, 898.

acanthocephala (Stoss., 1887) Stoss., 1899, 16 (in Belone acus).

laticollis (Rud., 1819) Stoss., 1899, 16 (in Trachurus trachurus).

TESTUCARIA Rud., 1805a, 44, for Festucaria.

TETRACOTILE Erc., 1881e, 48–54; 1882a, 284–290, for Tetracotyle.

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cutıcola (Nord., 1832) Kowal., 1902d, 23 (5) (in Scardinius erythrophthalmus); 1904, 25 (10).

cyprini idi Moul., 1856, 233.—Dies., 1858e, 366 (syn. of T. typica).

echinata Dies., 1858e, 367 (new name for Distoma cyprini idi (peritonei), see Duj.; and T. acerinæ cernuæ Claparède; in Leuciscus idus; Remi; Acerina cernua; Geneva).—Braun, 1892a, 796.—Reported also for Idus melanotus.

fœtorii Linst., 1876, 1–2, fig. 2 (in Fœtorius putorius).—Braun, 1892a, 796.

lenticola (Linst., 1878) Braun, 1892a, 600.

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———, GEOGRAPHIC DISTRIBUTION: Lebour, 1905, 100–105, 3 pls. (Northumbria).—Levin., [1881a], 52–84, pls. 2–3 (Greenland); [1881b].—Linst., 1883a, 274–314, pls. 6–9, figs. 1–52 (Turkestan); (1883b); 1886c, 40 pp., figs. 1–55 (Turkestan).—Looss, 1899b, 521–784, figs. a–b, pls. 24–32, figs. 1–90 (Egypt); 1900a, 390–401 (Egypt); 1900b, 458–466 (Egypt); 1900b, 458–466 (Egypt); 1902e, 637–644 (Triest), figs. 1–4; 1902f.

———, HISTOLOGY: Brand., 1891d, 30 pp.; 1892a, 558–577, 22 figs.—Gronkowski, 1902a, 510–536, figs. a–c, pl. 13, figs. 1–16; 1903a, 897–898; 1905, July, 49–50.—Schuberg, 1895, 431–432; (1895), 165–188, pl. 10; 1905, July 13, 23–24.

———, IN COLLECTIONS: Sons., (Pisa Museum), [1890], v. 7, 137–143; [1890], v. 7, Nov. 16, 173–178; 1891, Mar. 2, 290; [1893], Feb. 5, 183–190; 1893, Oct. 28, 566–567.

———, IN VARIOUS ANIMALS: AMPHIBIA: Castle, 1900a (in Rhynchobdellidæ).—Hollack, 1905, Feb. 18, 199–200; 1906, Jan. 30, 41 (Rana esculenta).—Macé, (1880), 61–89, pls. 1–4 (frogs); (1882), 32 pp., 4 pls. (frogs).—Vaillant, 1863, v. 4, Jan., 5–6 (Siren lacertina).

———, IN BIRDS: Bonnet, 1883a, 90–95 (Gallus gallus).—Braun, 1901c, 12–19, figs. 1–4; 1901f, 560–568 (revision); 1901g, 895–897, 941–948 (revision).—Hausmann, 1899a.—Kowal., 1898e, 412 (ducks).—Lint., 1888b, 367–369, 1 fig. (in hen's egg); 1888c, 51 (in hen's egg).—Rail., 1898, 412 (ducks); 1900, Mar. 16, 239–242 (hepatic); 1900, Oct., 514; 1901, Dec. 31, 986–987.

———, IN CRAYFISH: Lint., 1892c, 69–70.—Wright, 1884, Apr., 429–430.

———, IN CANADIAN VERTEBRATES: Staff., 1905, 681–694.

———, IN MAMMALS: Braun, 1901e, 311–348.

———, *in Castor fiber:* Bojanus, 1817b, 270–277.

———, *in Chiroptera:* Braun, (1900b), 217–236, pl. 10.

———, *in Bos taurus:* Giard & Billet, 1892a, 613–615 (Tonkin); 1893a, 245 (Tonkin).—Hedley, 1881a, 374–375 (lungs); 1881b, 399–400; 1881c, 27–28.—Littlewood, 1887a, 546.—*Stiles, 1898a,* 161 pp., 124 figs. (and sheep and swine).

———, *in Equus caballus:* Adams, 1876, 764–765 (liver).

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———, *in Ovis aries:* Penberthy, 1897, Apr., 238–251.—Sargent, ——, Feb., 273

———, *in Elephas indicus:* Cobbold, 1869b, 48–49; 1869c, 47–49.

———, *in Rodentia:* Leidy, 1888e, 126 (muskrat); 1889h, 612 (muskrat).

———, *in Homo sapiens:* Allen, 1881b, 257 (liver).—Ariola, 1905, 607–609.—Busetto, 1862a, 69 (ear).—Cobbold, 1875i, 423; 1875k, 780–781; 1876h, 209–212.—Fagge & Pye Smith, 1902, 4. ed., 475.—Grall, 1887a, 459–470, 4 figs.—Greef, 1905, 171–172 (and fish: in lens); 1905, Nov. 23, 1909; 1905, Dec. 14, 852; 1906, Jan. 1, 25–26.—Stiles, 1904i, 66 pp., figs. 9–88, pls. 1–3, figs. 1–8 (key).—1904k, 162; 1905p, 529; 1906, Jan. 30, 43.

———, IN MOLLUSKS: Leidy, 1877e, 200–202.—Pelseneer, 1900, 262–263 (marine).

———, *in Cardium edule:* Lebour, 1904, 82–84, 1 pl.—Nicoll, 1906, 148–155, 1 pl., 6 figs.; 1906, June 20, 313.

———, *in Ostrea:* Tennent, 1906, Aug., 445; 1906, 635–690, 4 pls.

———, IN FISH (*Pisces*): Ben., 1856d, 502–508, 1 pl., figs. 1–4 (Sciæna aquila); (1857g), 142–143 (Sciæna aquila).—Ariola, 1899a, 10 pp., pl. 5 (marine); 1899, 129–138, 1 pl.; ——, 299.—Hausmann, 1896a, 389–392 (fresh water); 1896b; 1897a, 1–42, figs. 1–12; 1897b.—Lint., 1898c, 507–548, pls. 40–54.—Luehe, 1900w; 1900cc, 677.—Maclaren, 1903, 260–262 (Naples).—Marshall & Gilbert, 1905a, 477–488, figs. 1–14 (Micropterus); 1905b, 703.—Pavesi, 1881, v. 14, 615–616.—Par. & Perugia, 1890, v. 1, 59–70 (gills, Italian); 1890, Aug. 29, 310; 1890, 16–32, 2 pls. (Adriatic); 1895, (31); 1895, July 22, 341 (marine); 1896, 135–138 (Brama raji); 1896, 2 pp.; ——, 653.—Par. & Perugia, 1889–1890, v. 4 (19), 16–32, 2 pls.; ——, v. 7 (24), June 6, 774–777.—Sons., 1890, Nov. 16 (Pagrus orphus).—Staff., 1904, May 3, 481–495 (Canadian); 1904, Aug. 17, 417; 1906, Jan. 30, 42–43.—Studer, 1884, v. 2 (1083–1091), 11.

———, IN REPTILES: Braun, 1899b, 714–725; 1899e, 627–632; (1901a), 58 pp., 2 figs., pls. 1–2, figs. 1–32; 1901b, 58 pp., 2 figs., 2 pls., figs. 1–32.—Looss, 1901l, 555–569, 618–625; 1902m, 411–894, figs. A–B, pls. 21–32, figs. 1–181 (Egyptian Chelonia); 1904c, 25–32; 1905l, 60–61.—McAlpine, 1891, Apr., 40–43 (copperhead).—Odhn., 1902, 19–46.—Sons., 1893, Oct. 2, 637 (and amphibians).

———, LARVÆ OF: Fil., 1856b, 83–86; 1857a, 129–132; 1858a, cxlvii.—McIntosh, 1861, in 4 pp., 9 figs. (in Carcinus mænas); 1865, v. 5, 201–204, figs. 1–9.—Moniez, 1891, Oct., 22–25.—Sons., (1897), v. 10, 249–253.

———, MONOGENETIC: St.-Remy, 1891, 405–416, pl. 10, figs. 1–40, 449–457; 1891, 1–21, 90–107; 1892, 136–145, 184–191, 224–230, 253–265, pl. 10; 1892, 92 pp., pl. 10, 40 figs.; 1898, 521–571, figs. 1–6.

———, NEW SPECIES OF: Brand., 1895b, 635.—Braun, 1892f, 44–52.—Fuhrmann, 1904, Sept. 23, 58–64; 1904, Nov., 229; 1905, June, 187; 1906, Jan. 30, 41.—Kuhn, 1829b, in 357–368, pl. 17 bis, figs. 1–17.—Linst., 1885b, in 235–255, pls. 13–15, figs. 1–31; 1886f, 249.—Macdonald, 1877, Jan., 209–212, figs. 1–15 (n. g.); 1877.—Poir., 1886, v. 10, 20–40, pls. 1–4, 30 figs.—Setti, 1891, 7 pp.

———, REPRODUCTION OF: Brand., 1891b, 264–267.—Linst., 1872a, 1–5, pl. 1, figs. A–C; 1872f, 99–112.—Moul., 1855; 1856, v. 3, 7–278, pls. 4–9.

———, TREATMENT: French, 1896a, 643–644.

——— *acotylea* Dies., 1858e, 311, subtribe.—Tasch., 1879, 234.

——— *cotylophora* Dies., 1858e, 312, 329, subtribe.—Mont., 1892, Oct. 7, 196.—Tasch., 1879, 234.

——— *monogenea* Tasch., 1879, 235.

——— *plectanophora* Dies., 1858e, 314, 374, subtribe; 1859c, 439.

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ranæ Valentin, 1843, 91, teste Dies., 1850a, 472.

salmonis lavareti Linst., 1878a, 266 (in Coregonus wartmanni; Greenland), based on Fabricius, ——, 269.

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1879: Tistomum Tasch., 1879, 65, misprint.

1888: Tristomun Mont., 1888a, 28, misprint.

1899: Tristonum Setti, 1899, 84, misprint.

aculeatum Couch, ——.—St.-Remy, 1898, 535 (=T. molæ).—Setti, 1898, 311 (syn. of rudolphianum).—Tasch., 1878, 570.

biparasiticum Goto, 1894a, 251–253 (in Parapetalus, Thynnus albacora; Misaki, Japan); 1899, 272.—Mont., 1899, 86, 89.—Setti, 1898, 311; 1899, 80; 1899, 124.—St.-Remy, 1898, 539.

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blanchardii Dies., 1850a, 430 (in Squalus sp.; New Zealand) (T. squali Bl., renamed).—Mont., 1891, 1892, 101, 103, 123.—Setti, 1898, 311 (blanchardi).—Tasch., 1878, 564, 567 (blanchardi).

cephala Risso, 1826, 262–263 (t. h. Tetraodon luna; Europe).—Dies., 1850a, 431.—Kroyer, 1852–53a, 745 (cephalo) (in Orthagoriscus mola).—Linst., 1878a.—Setti, 1898, 311.—St.-Remy, 1898, 535 (=T. molæ).—Tasch., 1878, 564 (cephalo).

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excavatum Nord. in Dies., 1850a, 428 (syn. of Encotyllabe nordmanni).

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molæ Bl., E. 1847a, 326–327 (t. h. Orthagoriscus mola).—Ben. & Hesse, 1864, 66, 76, 77–79.—Bettend., 1897a, 34, 35; 1897, 338, 339.—Brand., 1898a, (12, 14, 18). 204, 206, 210.—Braun, 1883a, 43; 1889k, 621; 1890a, 419, 423, 424, 425, 427, 428, 429, 431, 432, 445, 449, 450, 451, 455, 456, 458, 460, 465, 483, 512, 529, 547, 551 (in Orthag. mola; Atlantic Ocean (England), Mittelmeer (Nizza, Naples, Palmero, Triest)); 1892a, 617.—Cerf., 1898b, 345.—Dies., 1850a, 429 (of Bl., syn. of T. rudolphianum).—Fischer, 1883a, 22.—Goto, 1891a, 161; 1899, 272.—Haswell, 1892a, 459; 1893e, 121, 144, 145.—Heath, 1902, 127, 128, 131, 132.—Hoyle, 1890, 537.—Jackson, 1888, 644, 650.—Johnston, 1865a, 33.—Kath., 1894a, 138.—Knoch, 1894, 5, 11, 17.—Lint., 1901, 408, 414, 466.—Lœnnberg, 1891, 76.—Looss, 1885b, 12; 1894a, 146, 154.—Maclaren, 1904, 585, 589, 590, 608.—Mont., 1888a, 28 (Tristomun); 1888a, 7, 10, 13, 16, 17, 19, 23, 28, 29, 33, 50, 51, 52; 1890, 418; 1891, 101, 104, 107, 116, 118, 119, 120, 122, 123, pl. 5, fig. 4; 1892, Oct. 7, 172; 1893, 5–7; 1893, 77; 1899, 97, 98.—Par. & Perugia, 1889, 741, fig. 2 (in Mola aspera); 1890, 741, fig. 2 (in Mola aspera); 1890, 5.—Par., 1894, 549, 677, 680.—Poir., 1885, 138, 139, 147.—Pratt, 1900a, 658.—St.-Remy, 1898, 534, 535, 537.—Scott, 1901, 144 (in Orthagoriscus mola; W. coast Scotland); 1905, 118 (in Scott, 1901, pl. 8).—Setti, 1898, 309, 311; 1899, 124; 1899, 80, 81, 83.—Sons., 1890, 173 (in Orthag. mola); 1891, 265.—Staff., 1904, May 3, 482 (on Mola mola; Canada).—Stoss., 1891, 111; 1896, 191; 1898, 5–6.—Tasch., 1878, 564, 567; 1879, 232–265; 1880, 12 Jan., 17–18.

nordmanni (Dies., 1850) Tasch., 1878, 568 (syn. Encotyllabe nordmanni).

nozawæ Goto, 1894a, 249–251 (in Thynnus sibi; Osatsube (Hokkaido)).—Mont., 1899, 86.—Setti, 1898, 311; 1899, 80, 84 (nozawai); 1899, 122, 123, 124.—St.-Remy, 1898, 538–539 (nozawai).

nozawai St.-Remy, 1898, 538, for nozawæ.

onchidiocotyle Setti, 1899, 121–123, fig. 3 (in "tonno" at Portoferraio).—Par., 1899, 3; 1902, 3 (in Thynnus thynnus; Elba).

ovale Goto, 1894a, 241–244 (in Histiophorus orientalis, H. sp.; Misaki); 1899a, 271 (syn. of T. læve).—Mont., 1899, 86; 1899, 108.—St.-Remy, 1898, 535 (=T. læve).—Setti, 1898, 311; 1899, 79, 83.

ovata (Goto, 1894) Heath, 1902a, 132, apparently for Epibdella ovata.

pagelli (Ben. & Hesse, 1863) Tasch., 1878, 569 (syn. Encotyllabe pagelli).

papillatum Ben., 1858a, 1861a, 38 (refers to Kœlliker, 1849, 21, pl. 2).—Mont., 1893, 12.

papillorum Juel, 1889, 14, misprint.

papillosum Dies., 1836a, 313–316, pl. 17, figs. 13–16 (t. h. Xiphias gladius); 1850a, 430–431 (syn. Capsala papillosa) (in Orthagoriscus mola; Naples, Tetrapturus belone, Messina; Xiphias gladius; Panormi).—Ben., 1858a, 1861a, 169, 175, 176.—Ben. & Hesse, 1864, 66, 77.—Brand., 1891d, 14, 20.—Braun, 1883a, 45; 1889k, 621, 622; 1890a, 409, 419, 420, 424, 427, 430, 437, 438, 441, 444, 445, 456, 458, 487, 529, 547, 552; 1890b, 125; 1891d, 422; 1893b, 177.—Crety, 1893a, 384.—Duj., 1845a, 323.—Goto, 1894a, 237.—Grube, ——, 49.—Juel, 1889. 37.—Kœlliker, 1846, 469; 1847a, 469; 1849b, 21–27, pl. 2, figs. 1–4 (anatomy).—Kerbert, 1881a, 533.—Kroyer, 1852–53a, 745 (in Orthag. mola).—Linst., 1903, 280.—*Looss*, 1885b, 5, 10.—Mont., 1888a, 7, 16; 1889, 118; 1891,

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99, 101, 102, 103, 105, 110, 113, 114, 116, 119, 123, 124, pl. 5, figs. 1–3; 1893, 79.—Nord., 1840, 602 (to Capsala).—Par., 1889, 2–3; 1894, 543, 680, 698; 1902, 2 (in Xiphias gladius; Elba).—Par. & Per., 1890, 5.—Scott, T., 1901, 144.—Setti, 1898, 311, 312; 1899, 71, 72, 73, 74, 75, 76, 77, 83; 1899, 124.—Shipley, 1898, 354.—Sons., 1890, 173; 1891, 265 (in Orthag. mola).—Stoss., 1885, 162; 1898, 6.—Tasch., 1878, 701; 1878, 564, 567, 569, 570, 572 (syn. Caps. pap.); 1878, 176; 1879, 57, 59.—Wagener, 1857, 72.—Ziegler, 1883, 545.—Reported also for Carcharias glaucus.

pelamydis Tasch., 1878, 176; 1878, 569, 570 (in Pelamys sarda; Naples).—Braun, 1890a, 418, 487, 494, 497, 499, 519, 529, 547, 551.—Mont., 1888a, 86, 87; 1889, 117; 1891, 101, 105, 116, 123, pl. 6, fig. 20; 1899, 97.—Par., 1894, 680; 1902, 2 (in P. sarda; Elba).—Par. & Per., 1890, 5.—Setti, 1898, 311; 1899, 80, 81, 82; 1899, 124.—Sons., 1890, 173 (in P. sarda; Pisa).—Stoss., 1898, 6.

perugiai Setti, 1898, 7 pp., 1 fig. (on Tetrapturus belone Raf.; Spezia); 1898, 308–313, 1 fig.; 1899, 77, 79; 1899, 124.—Mont., 1899, 86.—St.-Remy, 1898, 539–540.

pini (Ben. & Hesse, 1863) Tasch., 1878, 568.—Massa, 1906, 56 (to Trochopus).

rhombi (Ben. & Hesse, 1863) Tasch., 1878, 568.—Massa, 1906, 58 (to Trochopus).

rotundum Goto, 1894a, 245–248, pl. 24, figs. 6–9 (in Xiphias gladius; Misaki).—St.-Remy, 1898, 537–538.—Setti, 1898, 311, 313; 1899, 77, 78, 83 (syn. of T. coccineum).

rudolphianum Dies., 1850a, 429 (t. h. Orthagoriscus mola; Anglia) (new name for Capsala sanguinea Blainv., T. molæ Blanchard, 1847, T. coccineum of Rud., Phylline coccinea Schweigger).—Johnston, 1865a, 33.—Kroyer, 1838–40a, 597; 1852–53a, 745 (in Orthag. mola).—Lint., 1898, 510; 1900, 281; 1901, 408, 414, 466.—Setti, 1898, 311 (syns. aculeatum Couch, cephala Risso, molæ Bl.); 1899, 84.—Stoss., 1898, 5.—Tasch., 1878, 564, 567.—Reported also for Mola mola.

scianæ Ben., Tasch., 1878, 568.

sinuatum Goto, 1894a, 239–241 (in Histiophorus sp.; Misaki); 1899a, 272.—Mont., 1899, 89; 1899, 108 (spelled also sinuatuun, 109).—St.-Remy, 1898, 536–537, 539.—Setti, 1898, 309, 311; 1899, 124.

sinuatuun Mont., 1899, 109, misprint.

soleæ (Ben. & Hesse, 1863) Tasch., 1878, 568; 1879, 59 to (Phylonella).

squali E. Bl., 1847, 327–328 (t. h. Squalus; New Zealand).—Ben. & Hesse, 1864, 76.—Braun, 1890a, 529, 547, 552.—Cuvier, ——, pl. 36, figs. 3, 3a.—Dies., 1850a, 430 (syn. of T. blanchardii).—Setti, 1898, 311; 1899, 84; 1899, 125.—Tasch., 1878, 564, 567.

sturionis (Abildg., 1794) Cuvier, 18—, pl. 36, figs. 4–4a or Bl., 1847, 329–330.—Ben. & Hesse, 1864, 67 (of Bl. syn. of Nitzschia elegans).—Dies., 1850a, 426 (syn. of Nitzschia elegans).—Johnston, 1865a, 34.—Tasch., 1878, 568 (of Bl. syn. of T. elongatum).

tubiporum Dies., 1836a, 14–15, pl. 1, figs. 14–16 (in Trigla hirundo); 1850a, 428 (renamed Trochopus longipes as type of Troch.).—Ben. & Hesse, 1864, 74, 75, 76, 77 (to Troch.).—Duj., 1845a, 323.—Massa, 1906, 43; 1906, 53, 54 (to Troch.).—Nord., 1840, 602 (to Capsala).—Sons., 1891, 261.—Stoss., 1898, 7 (in Trigla hirundo; Triest).—Tasch., 1878, 563, 564, 568 (in Trig. hir.).

uncinatum Mont., 1889h, 117–118, pl. 4, figs. 1–7 (in ?Pleuronectes; Coll. Leuck.); 1889i, 516; 1891, 101, 116, 123; 1893.—Braun, 1890a, 487, 497, 529, 547, 551 (in Hippoglossus sp.).—Goto, 1894a, 237.—Setti, 1898; 1899, 124.

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TRISTOMATINÆ Gamb., 1896a, 73.

TRISTOME [French] Blainv., 1824a, 515 ("Nouveau genre que M. Bosc avait nommé capsule pour un animal parasite sur les branchies des poissons, que je regarde de la famille des sangsues").

TRISTOMEÆ Tasch., 1879, 56, 57, 67; 1879, 235, 238.—Braun, 1883a, 58; 1890a, 516, 517, 523, 524, 525; 1890b, 127.—Cerf., 1894, 946, 948; 1895h, 914, 919; 1898b, 36.—Haswell, 1892a, 457.—Jackson, 1888, 644, 653 (includes: Tristomidæ, Monocotylidæ, Udonellidæ).—Juel, 1889, 14.—Hoyle, 1890, 539 (includes: Tristomidæ, Monocotylidæ, Udonellidæ).—Mont., 1888a, 15, 86 (Ttistomeæ); 1888a, 7, 10, 11, 12, 13, 15, 17, 18, 20, 21, 26, 27, 31, 32, 34, 36, 37, 42, 47, 48, *49, 50,* 53, 54, 56, 67, 70, 86, 87, 88, 96, 108, 110; 1891, 108.—Par. & Per., *1890, 5.*—Sons., 1890, 175.

1888: Ttistomeæ Mont., 1888a, 15, 86, misprint.

TRISTOMIDÆ Cobbold, 1877f, 326; 1879b, 4.—Braun, 1890a, 516, 517, 519, 523, 526, 538; 1893a, 889; 1896b, 7.—Cerf., 1894, 946, 948; 1894k, 936–948, figs. 1–6; 1894l, 175; 1895a, 21; 1895b; 1898b, 361; 1899a, 411.—Haswell, 1887a, 294, 299; 1892a, 457; 1893e, 114, 125.—Hoyle, 1890, 539 (Tristomum).—Jackson, 1888, 653 (Tristomum).—Mont., 1888a, 7, 15, 16, 19, 23, 30, 31, 34, 35, 67, 86, 87, 88, 96, 107, 108; 1891, 101, 108, 111, 122; 1891, 99–134, 1 fig., pls. 5–6, 41 figs.; 1892, Jan. 15, 99–134, 1 fig., pls. 5–6, figs. 1–41; 1892, Oct. 7 (fam. of Eterocotylea; contains Tristominæ, Encotyllabinæ, Udonellinæ); 1893, 21; 1899, 77; 113; 1903, 335 (contains subf. Tristominæ (g. Tristomum, Trochopus [=Placunella]; 2. Acanthocotylinæ (g. Acanthocotyle); 3. Ancyrocotylinæ (g. Ancyrocotyle, Epibdella [=Phylonella], Nitzschia); 4. Encotyllabinæ (g. Encotyllabe); 1905, 68.—Muehl., 1898, 17.—Pratt, 1900, 646 (includes: Tristominæ, Encotyllabinæ, Udonellinæ), 648.—St.-Remy, 1891, 55 pp., 2 pls.; 1891, 11 May, 1072–1074 (genital organs); 1892, 30 May, 702–703; 1892?, 1–55; 1892, 2 Oct., 615–616; 1898, 522, 532.—Schneidemuehl, 1896, 296.—Scott, 1901, 141.—Stoss., 1898, 5.—Tasch., 1879, (of Ben.) 68; 1879, 235.

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TRISTOMIDES Tasch., 1879, 235.—E. Bl., 1888a, 541 (embraced in Polystomiens).—Mont., 1888a, 86.

TRISTOMIDI Mont., 1892g, 99–134, figs. 1–41, for Tristomidæ.

TRISTOMII E. Bl., 1847, 321.

TRISTOMINÆ Braun, 1893a, 889.—Mont., 1892, Oct. 7, 213 (subf. of Tristomidæ, contains Tristomum, Nitzschia, Epibdella, Trochopus, Acanthocotyle); 1899, 81, 113; 1903, 335 (f. Tristomidæ).—Pratt, 1900, 646, 648 (includes: Tristoma, Nitzschia, Epibdella, Phyllonella, Trochopus, Acanthocotyle, Placunella).—St.-Remy, 1898, 532.

TRISTOMUM, see Tristoma.

TRISTOMUN Mont., 1888a, 28 (for Tristomum).

TRISTONUM Setti, 1899, 84, for Tristomum.

TROCHOPUS Dies., 1850a, 290, 428 (m. longipes) [not Carpenter, 1898, insect]; 1858e, 313, 365.—Ben., 1858a, 1861a, 38.—Ben. & Hesse, 1864, 66, 74.—Braun, 1890a, 411, 412, 415, 451, 465, 469, 511, 515, 516, 517, 519, 523, 526, 528; 1891d, 422; 1893a, 889.—Burm., 1856a, 251.—Gamb., 1896a, 73.—Goldb., 1855a, 20.—Massa, 1903, 252–255; 1906, 43–71 (syns.: Capsala Nord., Trist. Tasch., Placunella Ben. & Hesse).—Mont., 1888a, 7, 10, 11, 13, 52, 66, 86, 87, 97; 1891, 105, 107, 111, 124, 125; 1892, Oct. 7, 213 (gen. of Tristominæ); 1899, 98; 1903, 335=Placunella (subf. Tristominæ; f. Tristomidæ).—Pratt, 1900, 646, 648 (key).—Scott, 1901, 143; 1901, in 120–153, 2 pls.—St.-Remy, 1898, 534.—Sons., 1891, 260–261.—Stoss., 1898, 7.—Tasch., 1878, 566 (syn. of Tristomum).

differens Sons., 1891, 261 (in Cantharus lineatus Mont.).—Braun, 1891d, 422.—Massa, 1903, 255 (in C. lin.): 1906, 44, 46, 53, 60–61, 65, pl. 2, figs. 24, 25, 26 (syn. T. longipes Sons., 1890) (in C. lin.; Pisa).

diplacanthus Massa, 1903, 254 (in Trigla hirundo): 1906, 45, 46, 53, 56, 64, 65, 66, pl. 2, figs. 3, 4, pl. 3, fig. 33 (syn. Placunella pini Scott, 1901) (in T. hir.; Scotland).

exachanthus Par. & Perugia, 1889.—Massa, 1903, 255 (in Serranus gigas).—For hexacanthus.

heteracanthus Massa, 1903, see heterachanthus.

heterachanthus Massa, 1903, 252, 254 (in Trigla corax); 1906, 46 (heteracanthus), 48, 51, 53, 55, 57, 62, pl. 2, figs. 8, 9, 10, 11, pl. 3, figs. 27, 31, 37, 38, 39, 40, 41 (syns.: T. longipes Sons., T. tubiporus Sons.) (in Trig. co.; Naples).

hexacanthus (Par. & Perugia, 1889) Massa, 1906, 45, 46, 47, 53, 59–60, 65, pl. 2, figs. 15, 16, 17, pl. 3, figs. 28, 36 (in Serranus gigas; Genova).

lineatus Scott, 1901, 143–144, pl. 8, fig. 18 (in Trigla lineata; Clyde); 1905, 118.—Massa, 1903, 254 (in Trigla lineata); 1906, 45, 46, 52, 61, pl. 2, figs. 5, 6, 7, pl. 3, figs. 32, 35 (in Trigla lineata; Scotland).

longipes Dies., 1850a, 428 (= Trist. tubiporum 1835, renamed) (in Trigla hirundo); 1858e, 365.—Ben. & Hesse, 1863, 75; 1864, 75 (syn. of T. tubiporus).—Kroyer, 1838–40a, 582 (in Trig. hir.).—Massa, 1906, 53, 55 (syn. of T. tubiporus Dies.), 60 (of Sons., 1890) (syn. of T. differens Sons.), 62 (syn. of T. heteracanthus Massa).—Mont., 1891, 123, 124.—Sons., 1891, 260, 261.—Stoss., 1898, 7 (in Trig. hir.; Triest).—Tasch., 1878, 564, 565, 568 (syn. of T. tubiporum).

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micracanthus Massa, 1903, see micrachanthus.

micrachanthus Massa, 1903, 255 (in Trigla hirundo); 1906, 46, 53, 56, 63, 65, 66, pl. 2, figs. 21, 22, 23, pl. 3, fig. 29 (in Trigla hirundo; Genova).

microcanthus Massa, 1906, 66, for micracanthus.

onchacanthus Massa, 1906, 44, 46, 53, 65–66, pl. 2, figs. 12, 13, 14, pl. 3, fig. 30 (host unknown; Triest).

pini (Ben. & Hesse, 1863) Massa, 1903, 254 (in Trigla pini); 1906, 46, 53, 55, 56–58, 63, 65, 66, pl. 2, fig. 2 (syns.: Placunella pini Ben. & Hesse, Trist. pini Tasch., Troch. tubiporus Sons.) (in Trig. pini, T. hirundo, T. corax; Naples).

rhombi (Ben. & Hesse, 1863) Massa, 1903, 255 (in Rhombus maximus); 1906, 45, 46, 53, 58–59, 65, pl. 2, fig. 1 (syns.: Placunella rhombi Ben. & Hesse, Trist. rhombi Tasch.) (in Rh. max.; Brest).

tubiporus (Dies., 1835) Ben. & Hesse, 1864, 66, 75–76, pl. 6, figs. 8–13 (syns.: Trist. tubiporum, T. longipes) (in Trigla hirundo).—Braun, 1890a, 418, 424, 488, 528, 547, 552.—Massa, 1903, 253, 254 (in Trig. hir.); 1906, 44, 46, 53–55 [56, 57 (of Sons., 1901, 200, syn. of T. pini Ben. & Hesse)], 60, [62 (of Sons., 1891, 260, syn. of T. heteracanthus)], 65, 66, pl. 2, figs. 18, 19, 20, pl. 3, fig. 34 (syns.: Capsala tubipora Nord., Trist. tubiporum Dies.; Troch. longipes Dies.).—Mont., 1888a, 66; 1891, 104, 124, pl. 5, fig. 11, pl. 6, figs. 12–16.—Par. & Perugia, 1890, 5.—Pratt, 1900, 655, 657, fig. 7.—St.-Remy, 1898, 535.—Scott, A., 1901, 345; 1901, 143 (in Trigla hirundo).—Sons., 1891, 260, 261.—Stoss., 1898, 7.—Reported also for Cantharus lineatus.

TTISTOMEÆ Mont., 1888a, 15, 86, misprint for Tristomeæ.

TURBINILLA Bory St.-Vincent, 1823b, 356, genus of Cercariées.

TYLODELPHIS Pag., 1857, 38, pl. 4, fig. 7.—Mont., 1888a, 84.—Villot, 1898, 542 (for Tylodelphys).

TYLODELPHUS Kroyer, 1838–40a, 579.—Linst., 1878a, 290, for Tylodelphys.

TYLODELPHYS Dies., 1850a, 287, 304–305 (type clavata); 1858e, 311, 315–316.—Brand., 1888a, 12, 15, 52; 1890a, 578.—Braun, 1894, 166; 1895b, 132.—Goldb., 1855a, 16.—Mont., 1888a, 84 (Tylodelphis), 91.—Olss., 1893, 8.—Pag., 1857, 46.—Villot, 1898, 542 (Tylodelphis).

1888: Tylodelphis Mont., 1888a, 84, for Tylodelphys.

clavata (Nord., 1832) Dies., 1850a, 305 (in Acerina vulgaris, Perca fluviatilis, Lucioperca sandra, Esox lucius; Rhedoni); 1858e, 316.—Braun, 1892a, 796.—Kroyer, 1838–40a, 579 (in Acerina cernua).—Olss., 1893, 8.

craniaria Dies., 1858e, 316, based on Leydig, 1853, 382, pl. 14, fig. 6 (in Cobitis fossilis).—Braun, 1892a, 796.—Pavesi, 1881, 616.—To Diplost. by Cobbold, 1860.

petromyci fluviatilis Linst., 1878a, 290, for petromyzonis fluv.

petromyzi fluviatilis Braun, 1892a, 796.

petromyzonis fluviatilis Dies., 1858e, 316 (in Petromyzon fluviatilis) (syns.: Diplost. petromyzoni fluviatilis Mueller, ? Diplost. rachiæum Mueller).

rachidis Hannover, 1864a, 3.

rhachixa (Henle, 1833) Braun, 1892a, 796 (see rhachidis Dies.).

rhachidis Dies., 1850a, 305 (=Dubium ranarum Rud., Diplost. rhachiæum Henle, renamed) (in Rana esculenta, R. temporaria); 1858e, 316 (in Pelophylax esculentus).—Braun, 1893a, 871.—[Caldani, 1794, 312–318, pl. 7, figs. 7–8.]—Hannover, 1864a, 3 (rachidis).—Pag., 1857, 38, pl. 4, fig. 7 (in Rana esculenta).—[Rud., 1810a, 268 (Dubium ranarum).]

TYPHLOCŒLUM Stoss., 1902, 9, 30–32 (tod. flavum); 1902, 33 (syn. Monost. flavum) (in Anas boschas brasiliana).—Cohn, 1904, 229, 231 (syn. of Monost. flavum), 232.

cucumerinum (Rud., 1809) Stoss., 1902, 32–33, pl. 8, fig. 28 (syns.: Dist. cuc. Rud., Monost. cuc.) (in Avis riparia).

flavum (Mehlis, 1831) Stoss., 1902, 30–32, pl. 9, figs. 31, 32 (syn. Monost. fl.) (in Fuligula marila; Rossitten).—Cohn, 1904, 230–232, fig. 1

sarcidiornicola (Mégnin, 1890) Stoss., 1902, 33–34 (syn. Monost. sarc.) (in Sarcidiornis melanota; Madagascar).

UDONELLA Johnston, 1835a, 497 (m. caligorum); 1865a, 30, 34.—Ben., 1858a, 1861a, 11, 12, 190, 207, 210, 297.—Brand., 1894a, 308.—Braun, 1890a, 451, 452, 465, 468, 477, 483, 484, 490, 498, 511, 515, 516, 517, 518, 522, 523, 531, 532; 1893a, 890.—Burm., 1856a, 251.—Carus, 1863, 477.—Chatin, 1880f, 591; 1881a, 311.—Cobbold, 1879b, 463.—Dies., 1850a, 290, 427 (syns.: Hirudo? Kroyer, Amphibothrium Frey & Leuck.); 1858e, 313, 362–363 (m. caligorum); 1859c, 437.—Gamb., 1896a, 73.—Goldb., 1855a, 20.—Hoyle, 1890, 539 (type caligorum).—Jackson, 1888, 644, 653.—Leuck., 1863a, 489; 1879, 139; 1886d, 107.—Mont., 1888a, 10, 52, 70 (Udonetla), 84, 86, 88, 98; 1892, Oct. 7, 186, 213 (gen. of Udonellinæ); 1903, 336 (subf. Udonellinæ); 1905, 65.—Par. & Perugia, 1890, 14.—Pratt, 1900, 646, 649 (on Caligus and Anchorella), 655, fig. 12.—Scott, T., 1901, 144.—Stoss., 1898, 8.—Tasch., 1878, 572; 1879, 236, 238; 1879, 56, 59, 68, 73.—Wagener, 1857, 25, 26.

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caligarum Tasch., 1878, 564, 565, 572–573, for caligorum.

caligi (Kroyer—) Ben., 1858a, 1861a, 189.

caligorum Johnston, 1835a, 497, fig. 45 a–c (on Caligus on Hippoglossus vulgaris); 1865a, 34, 299–300, fig. 49.—Ben., 1858a, 1861a, 12, 13–18, pl. 1, figs. 1–15 (syns.: Phylline caligi Kroyer, Amphibothrium kroyeri) (in Pleuronectus hippoglossus, Gadus morrhua, Trigla gurnardus), 260.—Braun, 1890a, 418 (caligarum), 468, 485, 500, 512, 532, 548, 550, 551 (in Caligus sp.; North Sea; Atlantic Ocean).—Cobbold, 1879b, 484.—Dies., 1850a, 427 (syns.: Hirudo Kroyer, Amphibothrium kroyeri Frey & Leuck.); 1858e, 363; 1859c, 437 (in Caligos hippoglossi vulgaris et gadi morrhuæ; Belgia).—Gamb., 1896a, 55, fig. 22B.—Grube, 1851, 116, 150.—Hoyle, 1890, 539 (on Caligus which is on Hippoglossus vulgaris).—Jackson, 1888, 646, 650 (on Caligus).—Moul., 1856a, 11.—Pag., 1857, 11.—Pratt, 1900, 655, fig. 12, 657.—Quatrefages, 1854, 23.—Scott, 1901, 144 (in Caligus curtus); 1905, 118; 1901, pl. 8.—Staff., 1904, May 3, 482 (on Caligus on Gadus callarias; Canada).—Tasch., 1878, 564, 565, 572–573 (caligarum).

hirundinis (Ben. & Hesse, 1863) Tasch., 1878, 573 (syn. Echinella hirundinis).

lupi Ben. & Hesse, 1863, 92, pl. 8, figs. 11–14 (in Labrax lupus).—Braun, 1890a, 408, 417, 427, 482, 532, 548, 550, 551 (in L. lup.; Atlantic Ocean).—Mont., 1890, 420.—Stoss., 1898, 8.—Tasch., 1878, 573.

merlucii Ben. & Hesse, 1863, 93; 1864, 93 (in Merlucius vulgaris).—Braun, 1890a, 417, 532, 548, 550, 551 (in M. vulg.; Atlantic Ocean).—Tasch., 1878, 573.

molvæ (Ben. & Hesse, 1863) Tasch., 1878, 573.

pollachii Ben. & Hesse, 1863, 90–91, pl. 8, figs. 1–8; 1864, 90–91, pl. 8, figs. 1–8 (in Merlangus pollachius).—Braun, 1890a, 408, 410, 417, 446, 510, 532, 548, 550, 551 (in M. poll.; Atlantic Ocean).—Gamb., 1896a, 58, fig. 25B.—Mont., 1888a, 7, 10, 34.—Tasch., 1878, 573.

sciænæ Ben. & Hesse, 1863; 1864, 93, pl. 8, figs. 15–16 (in Sciæna aquila).—Braun, 1890a, 465, 532, 548, 549, 552 (in S. aq.; Atlantic Ocean).—Tasch., 1878, 573.

triglæ Ben. & Hesse, 1863; 1864, 92, pl. 8, figs. 9–10 (in trigles).—Braun, 1890a, 417, 446, 532, 548, 550, 552 (in Trigla sp.; Atlantic Ocean).—Tasch., 1878, 573.

UDONELLIDÆ Tasch., 1879, 235 (Udonellides), 236; 1879, 68.—Braun, 1890a, 516, 517, 523, 526, 531; 1896b, 7.—Cerf., 1894, 946, 947, 948; 1898b, 361, 362.—Haswell, 1893c, 125.—Hoyle, 1890, 539 (Udonella).—Jackson, 1888, 653 (Udonella).—Mont., 1888a, 7, 10, 13, 18, 34, 36, 66, 67, 86 (Udonellides), 88, 98, 108, 110; 1891, 108; 1903, 336 (subf. Undonellinæ (g. Udonella, Echinella, Pteronella).—Scott, 1901, 141.

UDONELLIDES Tasch., 1879, 235 (see Udonellidæ).—Mont., 1888a, 86.

UDONELLINÆ Mont., 1892, Oct. 7, 213 (subf. of Tristomidæ); 1903, 336 (f. Udonellidæ).—Braun, 1893a, 890.—Pratt, 1900, 646 (includes: Udonella, Echinella, Pteronella), 649.—Scott, T., 1900, 141, 144.

UDONETLA Mont., 1888a, 70, for Udonella.

UNICOLA Rafinesque, 1815, 151, genus of Fasciolaria, nomen nudum; to contain species of Fasciola, but these are not mentioned. The name has therefore no status at present.

UROCENTRUM Nitzsch, 1827. 68 (m. Cerc. turbo).

UROGONIMINÆ Looss, 1899b, 655.—Pratt, 1902, 889, 906 (includes Urorygma, Urogonimus, Urotocus, Urotrema).

UROGONIMUS Mont., 1888a, 15, 92, 104 (tod. macrostomus); 1892, Oct. 7, 214 (gen. of Distominæ); 1893, 82, 154, 155, 157, 162, 164, 165; 1896, 167.—Braun, 1892a, 696, 699, 715, 727, 736; 1893a, 885, 886, 890, 893, 909, 911; 1895b, 138; 1900h, 3; 1900, 390; 1900, 234, 1901, 942, 943; 1902b, 136, 140.—Darr, 1902, 655.—Looss, 1894a, 173, 174; 1896b, 139; 1899b, 536, 538, 542, 551, 648, 653–654, 655, 665, 749, 750.—Luehe, 1899, 532; 1900, 555.—Moniez, 1896a, 90.—Nickerson, 1902, 606.—Ofenheim, 1900, 183.—Poche, 1907, 125.—Pratt, 1902a, 889, 906.—Stiles, 1901, 176, 194.—Stiles & Hass., 1898a, 95, 96 (syn. Leucochloridium), type Fasc. macrostoma.—Stoss., 1892, 4, 5; 1898, 23.—See also Leucochloridium 1835.

cercatum, see cercatus.

cercatus (Mont., 1893) Mont., 1893, 40, 42, 43, 83, 95, 102, 157 (cercatum and cercatus), 162-166, pl. 5, figs. 64–65; 1896, 167.—Looss, 1894a, 174 (cercatum); 1896b, 139, 140; 1899b, 654, 750.—Mueh., 1898, 16 (footnote); 1898, 99.

insignis Looss, 1899b, 596, 654, 748–750, figs. 49, 71 (in Fulica atra; Marg, Egypt).

macrostomum (Rud., 1803) Mont., 1893, 27, 67, 68, 76, 83, 95, 102, 107, 157.

macrostomus (Rud., 1803) Mont., 1892, Oct. 7, 187 (macrostomum); 1893, 27, 67, 68, 76, 83, 95, 102, 106, 107, 157, 162, 164 (macrostomum and macrostomus); 1896, 167.—Braun, 1901, 562, 564, 565, 567, 568; 1902b, 40 (in Fringilla cœlebs), 42 (in Fringilla linaria, Parus palustris, of Vienna Col., Nos. 361 and 466), 124, 125 (macrostomum), 136, 139 (syns.: Dist. elegans pars, D. caudale of Mueller in Coracias garrula, D. holostomum Rud., 1819, Cladocœlium hol. Stoss., 1892) (in Rallus aquaticus, Gallinula chloropus, G. porzana).—Jacoby, 1900, 20.—Kowal., 1902d, 28 (10); 1904, 25 (10) (in Turtur aurita; Dublany).—Looss, 1896b, 139 (to Dist.); 1899b, 654, 750, 761.—Muehl., 1898, 16, 17, footnote); 1898, 22, 99, 101.—Stoss., 1896, 127, fig. 1; 1898, 23–24 (in Numenius tenuirostris; Monfalcone).—Reported also for Passer domesticus.

rossittensis Mueh., 1898, 16–17 (in Turdus pilaris; East Prussia); 1898b, 4, 22, 100–101, fig. 15 (at Rossitten).—Jacoby, 1900, 20.—Looss, 1899b, 654, 750, type of Urotocus.

URORYGMA Braun, 1901g, 942 (m. nanodes); 1902b, 138.—Pratt, 1902, 889, 904 (key to).

nanodes Braun, 1901g, 942–943 (in Falco nitidus; Brazil); 1902b, 138–140, figs. 81, 82.

UROTOCUS Looss, 1899b, 654–656 (tod. m. rossittensis); 1902m, 839.—Braun, 1900, 234; 1900, 390; 1902b, 140.—Luehe, 1901, 488.—Ofenheim, 1900, 183.—Pratt, 1902, 889, 907.

rossittensis (Mueh., 1898) Looss, 1899b, 655.

UROTREMA Braun, 1900, 390–391 (m. scabridum); 1902b, 140.—Looss, 1902m, 839.—Luehe, 1901, 488.—Pratt, 1902, 889, 901.

scabridum Braun, 1900, 390–391 (in Fledermaus); 1900b, 234–236, pl. 10, figs. 5, 10 (Noctilio macropus, Molossus, Phyllostoma; Brazil).

VALLISIA Par. & Per., 1890, 21 (m. striata); 1890, 18 (striata), Octocotylidæ.—Braun, 1890a, 407, 451, 453, 469, 481, 484, 519, 523, 534, 536, 546; 1893a, 890.—Cerf., 1895h, 920; 1896, 515.—Gamb., 1896a, 73 (Vallisnia).—Mont., 1892, Oct. 7, 213 (subg. in Octocotylinæ); 1903, 336 (subf. Octobohtrinæ).—Pratt, 1900, 646, 651 (key), 656, fig. 32.—Stoss., 1898, 13.

striata Par. & Per., 1890, 21 (in Lichia amia; Triest); 1890, 7; 1891, Jan. 19, 17–19.—Braun, 1890a, 534, 536, 548, 551 (in Lichia amia; Mittelmeer, Triest).—Par., 1894, 594, 671.—Pratt, 1900, 656, 657, fig. 32.—Sons., 1890, 138 (to Octocotyle).—Stoss., 1898, 13–14.

VALLISNIA Gamb., 1896a, 73, for Vallisia.

VERTUMNUS Otto, 1823, 294–300 (m. thetidicola), syn. of Phœnicurus.

thetidicola Otto, 1823, 294–300, pl. 41, figs. a–f (in Thetis fimbria) (syn. of Phœnicurus varius Rud.).—Braun, 1889a, 326.—Krohn, 1842a, 418–423.

VIRGULINA Bory St.-Vincent, 1823b, 356, genus of Cercarieés.

WEDLIA Cobbold, 1860a, 37–38 (bipartita Wedl, from Thynnus vulgaris, was clearly intended as type).—Braun, 1893a, 894 (faba apparently taken as type by elimination).—Mont., 1888a, 9, 93; 1892, 714.—Tasch., 1879, 607.

1878: Didymozoon Tasch., 1878, 716.

1884: Weidlia Scudder, 1884, 335, misprint.

WEDLIA—Continued.

1902: Didymostoma Ariola, 1902, 103 (bipartitum).

bipartita (Wedl, 1855) Cobbold, 1860a, 38 (in Thynnus vulgaris).—Mont., 1893, 150.—Type of Didymostoma 1902.

faba (Bremser, 1831) Cobbold, 1860a, 38 (syns.: Monost. faba Bremser, Duj., Crep., Dies.; M. bijugum Miescher, Sieb.; Globularia Orlando) (in Fringilla canaria, F. domestica, F. spinus, Parus major, Sylvia sibilatrix, S. trochilus, Motacilla boarula).

WEIDLIA Scudder, 1884, 335, misprint for Wedlia.

XENODISTOMUM Staff., 1904, May 3, 483 (ξένος=stranger) (m. melanocystis).

melanocystis Staff., 1904, May 3, 483 (t. h. Lophius piscatorius; Canada) (μέλας, black; κύστις, bladder).—Odhn., 1905, 310.

ZEUGORCHIS Staff., 1905, Apr. 11, 691–692 (ζεῦγος, pair; ὄρχις, testicle) (m. æquatus).

æquatus Staff., 1905, Apr. 11, 691–692 (= Dist. sp. Staff., 1902, 482) (in Eutenia sirtalis; Canada).

ZEUGORCHIS Nicoll, 1906, 514 (m. acanthus); 1907, 128, renamed Parorchis.

acanthus Nicoll, 1906, 514, 519–522, pl. 12, figs. 4–5, pl. 13, figs. 6–7 (in Larus argentatus).

(XIPHIDIOCERCARIA) Dies., 1855a, 388–390 (subg. of Cercaria); 1858d, 253, renamed C. (Acanthocephala).

1858: C. (Acanthocephala) Dies., 1858d, 253–255.

armata (Sieb., 1837) Dies., 1855a, 388; 1858d, 251, to C. (Acanthocephala).—See endoloba, type of Opisthioglyphe 1899.

gibba (Fil., 1854) Dies., 1855a, 389; 1858d, 257, to C. (Acanthocephala).

macrocerca (Fil., 1855) Dies., 1855a, 389; 1858d, 255, to C. (Acanthocephala).—See cygnoides, type of Gorgodera.

microcotyla (Fil., 1854) Dies., 1855a, 390; 1858d, 253, to C. (Acanthocephala).—See tetracystis, type of Cystagora.

vesiculifera Dies., 1855a, 389; 1858d, 254, to C. (Acanthocephala).

vesiculosa (Fil., 1854) Dies., 1855a, 389 (syn. of Cerc. vesiculifera).

ZOOGONINÆ Odhn., 1902, 63–64.—Goldschmidt, 1902e, 870.—Pratt, 1902, 889, 906 (key) (Zoögonus, Zoögonoides).

ZOOGONOIDES Odhn., 1902, 61, 64 (tod. viviparus).—Goldschmidt, 1902e, 870.—Pratt, 1902, 889, 906 (key).

viviparus (Olss., 1868) Odhn., 1902, 62–63, 64, fig. 2.—Goldschmidt, 1902e, 870.—Nicoll, 1907, 72, 83–84, pl. 2, fig. 8, pl. 3, fig. 9 (in Pleuronectes limanda, P. platessa, Rhombus maximus).

ZOOGONUS Looss, 1901d, 439 (tod. mirus indicated by "n. g. n. sp.").—Luehe, 1901, 176.—Odhn., 1902, 58–63, 64.—Pratt, 1902, 889, 906 (key).

mirus Looss, 1901, 439–442, fig. 6 (in Labrus merula; Triest).—Goldschmidt, 1902e, 870–876, figs. 1–6 (in Labrus merula); 1903a, 535–536; 1905, July, 56; 1905, 607–654, pls. 36–38, figs. 1–42.—Nicoll, 1907, 83.—Odhn., 1902, 58, 59, 60, 61, 64.—Rœwer, 1906, 220, 221.

rubellus (Olss., 1868) Odhn., 1902, 59–61, 63, fig. 1.—Goldschmidt, 1902e, 870, 872, 873.

viviparus (Olss., 1868) Looss, 1901, 439, 440, 441, 442.—Type of Zoogonoides 1902.

ZOOSPERMA Bory St.-Vincent, 1823b, 356.

ADDENDA.

Since the manuscript of this bulletin left our hands, a number of additional references to trematodes have come into our possession. Only such references as involve new names and new combinations will be inserted in the addenda.

Particular attention is invited to an important change in the International Code relative to the collective groups, namely:

ART. 8.—Recommendation: Certain biological groups which have been proposed distinctly as collective groups, not as systematic units, may be treated for convenience as if they were genera, but they require no type species. Examples: *Agamodistomum, Amphistomulum, Agamofilaria, Agamomermis, Spirganum.*

In the present bulletin, types were designated for certain of these groups before the foregoing article was adopted. Such designation becomes null and void under this article.

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ADDITIONAL SPECIFIC NAMES.

acanthus Nicoll, 1906. [See supra, p. 10.] Add: 1907: Parorchis.

affinis Looss, 1907, 158, t. h. Anguilla chrysypa, Osmerus mordax; U. S. A.—1907: Brachyphallus.

albida Braun, 1893. [See supra, p. 12.] Add: 1898: Campula.

angulatum Linst., 1907, 202, t. h. Lucioperca sandra; Wolga.—1907: Phyllodist.

annuligerum Nord., 1832. [See supra, p. 14.] Add: 1904: Diplost.

appendiculata Pelseneer, 1906, 167, t. h. Natica alderi; Boulogne-sur-Mer.—1906: Cerc.

baccutus Nicoll, 1907, 72, t. h. Hippoglossus vulgaris; Scotland.—1907: Stephanochasmus.

bacillare Mol., 1859. [See supra, p. 16.] Add: 1907: Ophecona, type.

baculatum Lint., 1907, 119, for baculum (Gasterost.).

bathycothyle Fischder., 1903h, 542, for bathycotyle (Paramphist.).

bovium Nakahama, (1883b).—1883: Amphist.

branchialis Willem, 1906, 599, t. h. Raie bouclée; Belgium.—1906: Acanthocotyle.

brevicauda Pelseneer, 1906, 167, t. h. Littorina rudis; Wimereux.—1906: Cerc.

breviductus Looss, 1907, 596, t. h. Pelamys sarda; Atlantic Ocean.—1907: Dinurus.

burki Rathelot, 1892a, 14, for buskii (Dist.).

buski Rail., 1898, 172, for buskii Lankester.—1898: Campula.

caducum Looss, 1907, 615, t. h. Umbrina cirrhosa.—1907: Pristisomum.

calculus Looss, 1907, 610, t. h. Larus argentatus, L. ridibundus; Triest.—1907: Pachytrema.

caligarum Ben., 1858a, 1861a, 12, for caligorum (Udonella).

cignoides Desmonceaux, 1868a, 21, for cygnoides (Dist.).

columbæ Mazzanti, 1889. [See supra, p. 24.] Add: 1890: Mesogonimus.

commutatum Dies., 1850. [See supra, p. 24.] Add: 1898: Clinost.

complexa Stiles & Hass., 1894. [See supra, p. 25.] Add: 1898: Campula.

conchicala Nord., 1833b, 281, for conchicola (Aspidogaster).

conchilega Braun, 1883a, 41, for conchicola (Aspidogaster).

conjuncta Cobbold, 1860. [See supra, p. 25.] Add: 1898: Campula.

conus Crep., 1825. [See supra, p. 26.] Add: 1898: Campula.

cornu Dies., 1839. [See supra, p. 26.] Add: 1907: Diplodiscus.

cornuta Mueller, 1776a, 221.—1776: Plan.

cotti Zschokke, 1884, 6, t. h. Cottus gobio.—1884: Sporocystis.

crenatum Mol., 1859. [See supra, p. 27.] Add: 1907: Lecithocladium.

crispata Pelseneer, 1906, 171, t. h. Natica alderi; Boulogne.—1906: Cerc.

cristatum Rud., 1819. [See supra, p. 27.] Add: 1907: Lecithocladium.

cuculus Thoss, 1897, 1, t. h. Larus ridibundus; Kiel.—1897: Holost.

cygnoides ranæ Wagener, 1857, 19.—1857: Dist.

cylindriaccum Daday, 1907, 560, for cylindraceum (Dist.).

cylindricus Dies., 1836. [See supra, p. 28.] Add: 1907: Pseudocladorchis, type.

dentalii Pelseneer, 1906, 170, t. h. Dentalium tarentinum.—1906: Cerc.

didactyla Mrazek, 1907, 1, t. h. Atyaëphyra desmarestii; Plavnica.—1907: Scutariella.

dipsilis Nicoll, 1907, 247, t. h. Oidemia fusca, O. nigra; Great Britain.—1907: Gymnophallus.

dorsale Freund, 1907, 718, for chordale (Amphist.).

egyptiaca Pease, 1901b, 7, for ægyptiaca (Fasc.).

emasculans Pelseneer, 1906, 166, t. h. Littorina rudis; Wimereux.—1906: Cerc.

endorfii Par. & Perugia, 1895, 2, for hendorfii (Phylline).

excellens Nicoll, 1907, 247, t. h. Larus argentatus; Great Britain.—1907: Spelotrema.

fenestratum Lint., 1907, 111, t. h. Lycodontis moringa; Bermuda.—1907: Dist.

feriatum Nicoll, 1907, 247, t. h. Ægialitis hiaticula, Hæmatopus ostralegus, Pelidna (Tringa) alpina, Totanus calidris, Vanellus vanellus; Great Britain.—1907: Spelotrema.

ferrum-equinum Dies., 1836. [See supra, p. 35.] Add: 1907: Microrchis.

filum Looss, 1907, 606, t. h. Talpa europæa; Leipzig.—1907: Ityogonimus.

furcata Mueller, 1786a, 299, free form.—1786: Vorticella. 1816: Furcularia. [1825: Furcocerca serrata.]

fusiforme Luehe, 1901. [See supra, p. 37.] Add: 1907: Sterrhurus.

galeatus Looss, 1907, 165, t. h. Mugil auratus; Coast of Egypt.—1907: Lecithaster.

gazzettæ Arch. f. Naturg., 1901, v. 2 (8), 188, for garzettæ (Echinost.).

giardi Pelseneer, 1906, 170 t. h. Buccinum undatum; Boulogne.—1906: Cerc.

glaviger Ssinitzin, 1906, 687, for claviger (Pleurogenes).

gracilius Pelseneer, 1906, 176, for grascilescens (Gasterost.).

grandiporum Rud., 1819. [See supra, p. 39.] Add: 1907: Sterrhurus.

gratiosum Nicoll, 1907, 247, t. h. Pelidna (Tringa) alpina; Great Britain.—1907: Maritrema.

gravidum Looss, 1907, 603, t. h. Anguilla vulgaris; ?Triest.—1907: Lecithochirium.

gulosum Lint., 1901. [See supra, p. 39.] Add: 1907: Lecithocladium.

gyrinus Lint., 1907, 107, t. h. Lactophrys tricornis, L. trigonus; Bermuda.—1907: Dist.

hæmatodium Dewitz, 1892b, 106, for hæmatobium (Dist.).

haswelli Mont., (1898), 1899, 122, see blanchardi 1893.—1899: Actinodactynella (type).

hepaticum hominis Cobbold, 1884g, 976.—1884: Dist. See Fasc. hep.

heterophyes Sieb., 1853. [See supra, p. 41.] Add: 1898: Clinost. 1904: Paragonimus.

hæmatobium Rathelot, 1892a, 14, 15, for hæmatobium (Dist.).

humile Nicoll, 1907, 247, t. h. Totanus calidris; Great Britain.—1907: Maritrema.

imocavus Looss, 1907, 601, t. h. Thynnus sp. (?thunnina); Alexandria, Egypt.—1907: Sterrhurus.

inermis Goto, 1899a, 273, see læve var. inermis (Trist.).

inversum Looss, 1907, 615, t. h. Chrysophrys aurata; Triest.—1907: Placotrema.

jacksoni Cobbold, 1869a, 80, for jacksonii (Fasc.).

jaksoni Stazzi, 1900, 3, 4, 5, for jacksonii (Fasc.).

jejunum Nicoll, 1907, 248, t. h. Totanus calidris; Great Britain.—1907: Tocotrema.

kordatum see cordatum.

laguncula Looss, 1907, 69, t. h. [fish]; Triest.—1907: Aponurus, type.

lamelliforme Lint., 1907, 108, t. h. Balistes carolinensis, Lactophrys tricornis, L. trigonus; Bermuda.—1907: Dist.

lapidus Looss, 1907, 69, t. h. fish. [See p. —.]—1907: Ectenurus.

laurentina Borelli, 1897, 1.—1897: Plan.

lenori Mont., 1896, 167, for lenoiri (Cephalogonimus).

lepidum Nicoll, 1907, 247, t. h. Larus argentatus; Great Britain.—1907: Maritrema.

lepidus Looss, 1907, 597, t. h. Lichia amia.—1907: Ectenurus, type.

leptosomum Rœwer, 1906, 185, 186, for leptostomum (Dist.).

levenseni Lint., 1907, 110, t. h. Epinephelus maculosus, E. striatus; Bermuda.—1907: Dist.

longisinus Looss, 1907, 596, t. h. Coryphæna hippuris; Red Sea, Aden.—1907: Dinurus.

lophocerca Fil., 1857. [See supra, p. 49.] Add: 1907: Monost.

lugubris Morgan, 1901, 179.—1901: Plan.

lunatus Dies., 1836. [See supra, p. 49.] Add: 1907: Chiorchis.

macrophallos Linst., 1875. [See supra, p. 50.] Add: 1907: Levinseniella.

macrostomus Daday, 1907, 506, t. h. Salmo pacupa, S. sp.; South America.—1907: Pseudocladorchis.

mamillaris Gærtner in Pallas, 1774, 20.—1774: Distomus.

marenzelleri Daday, 1907, 473, t. h. Salmo sp.; South America.—1907: Diplodiscus.

margaritarum Dubois, 1901. [See supra, p. 51.] Add: 1907: Gymnophallus.

marmorata Bosc, 1802a, v. 1, 262, for marmorosa?.—1802: Plan.

m'connelli McConnell, 1878a, 406, for macconnelli (Dist.).

megacotyle Dies., 1836. [See supra, p. 52.] Add: 1907: Microrchis, type.

megalocotyle Walter, 1893, 19, 24, for megacotyle (Amphist.).

melangi Lebour, 1907, 442, for merlangi (Octobothrium).

migocera Lebour, 1906, 7, for myocerca (Cerc.).

minor Ben., 1858, 98, see armata minor (Cerc.).

montenegrina Mrazek, 1904a, 1; Montenegro.—1904: Plan.

monticelli Mont., 1905, 74, for monticellii (Acanthocotyle).

muehlingi Nicoll, 1907, 257, 259, for mühlingi (Dist.).

musculus Looss, 1907, 600, t. h. Anguilla vulgaris, Dentex vulgaris; Triest.—1907: Sterrhurus, type.

myocercoides Pelseneer, 1906, 162, t. h. Syndosmya alba; Boulogne-sur-Mer.—1906: Cerc.

nanus Stiles & Goldberger, 1908, 23, t. h. Francolinus subtorquatus; Africa.—1908: Agamodist.

nephrodorchis Daday, 1907, 501, t. h. Salmo pacu, S. pacupa; South America.—1907: Pseudocladorchis.

nigrotincta Pelseneer, 1906, 166, t. h. Syndosmya alba; Boulogne-sur-Mer.—1906: Cerc.

novæ zealandiæ Haswell, 1888, 50, for novæ zelandiæ (Temnocephala).

obtusicauda Pelseneer, 1906, 182, for obtusicaudata (Cerc.).

obtusicaudata Pelseneer, 1906, 167, t. h. Natica alderi; Boulogne.—1906: Cerc.

oocysta Lebour, 1907, 439, t. h. Paludestrina stagnalis; Northumberland Coast.—1907: Cerc.

opaca Ward, 1894. [See supra, p. 59.] Add: 1907: Levinseniella.

ophtalmobium Rathelot, 1892a, 14, for ophthalmobium (Dist.).

paguri Nord., 1833b, 379.—1833: Polyst.

pankreatikum Katsurada & Saito, ——, Hyg. Centralbl., v. 3, Oct., 279, for pancreaticum (Dist.).

papillatus Daday, 1907, 520, t. h. Cholossoma brachyponia; Paraguay.—1907: Chiorchis.

paronæ Mont., 1907, 3, t. h. Crenilabrus pavo; Genoa.—1907: Encotyllabe.

parvirenalis Pelseneer, 1906, 165, t. h. Natica alderi; Boulogne.—1906: Cerc.

pedicillatum Luehe, 1900a, 487, for pedicellatum (Dist.).

pellucida Jægers. 1907, 134, t. h. Anas boschas fera, Fuligula fuligula; West Coast of Sweden.—1907: Levinseniella.

petromyzi fluviatilis Dies., 1858e, 316, for peteromyzi fluviatilis (Diplost.).

philippinensis Stiles & Goldberger, 1908, 23, t. h. Bos sp.; Manila, P. I.—1908: Homalogaster.

pirum Lebour, 1907, 439, t. h. Paludestrina stagnalis; Northumberland Coast.—1907: Cerc.

polymastus Schneidemuehl, 1896, 303, for polymastos (Gastrodiskus).

pristis Mola, 1907, 39, for pristis (Dist.).

propinqua Jægers., 1907, 135, t. h. Charadrius hiaticula, Hæmatopus ostralegus; West Coast of Sweden.—1907: Levinseniella.

pumex Looss, 1907, 615, t. h. Caranx trachurus.—1907: Pristisomum.

[*pupula* Bory St.-Vincent, 1825b, 252.—1825: Histrionella.]

pusillum Harz, 1881c, 3, for pusillum (Dist.).

putorii Schrank,? or Gmelin, 1790. [See supra, p. 66.] Add: 1898: Echinost.

quadrangulatum Daday, 1907, 470, t. h. Salmo pacu; Cuyaba.—1907: Dist.

raggazzii Janicki, 1907, 719, for ragazzii (Syncœlium).

rajazzii Ariola, 1899, 135, for ragazzii (Dist.).

ranerium Nardo, 1833a, 523, for raynerianum (Dist.).

rathousii Mont., 1893, 33, for rathouisi (Dist.).

ropaloïdes Olss., 1867a, 19, 48, for ropaloides (Amphist.).

rugosa Dies., 1850a, 408, t. h. Antilope pyarga; Port Natal.—1850: Gyrocotyle, type.

rugosus Looss, 1907, 591, t. h. Clupea pilchardus, C. sardina, Rhombus maximus; Triest.—1907: Hemiurus.

sanguicola delle Chiaje, 1825a, 15.—1825: Hexathyridium.

scienæ Fraip., 1880c, 442, for sciænæ (Epibdella).

scleroporum Rud. of Brand., 1891d, 19, for Crep.?—1891: Amphist.

semifuscum Looss, 1907, 607, t. h. Circetus [=Circœtus?] gallicus; Genoa.—1907: Platynosum, type.

seminis Owen, 1835l, 394.—1835: Cerc.

serrata Bory St.-Vincent, 1825a, 84, t. h. "infusion de foin."—1825: Furcocerca.

siluris glanidis Hofer, 1904a, 169, for siluri glanidis (Dactylogyrus).

simile Jægers., 1900. [See supra, p. 72.] Add: 1906: Dist.

simplicissima Morgan, 1904, 385.—1904: Plan.

sinensis Cobbold, 1875. [See supra, p. 72.] Add: 1898: Campula.

stellatus Looss, 1907, 165, t. h. Belone acus, Dentex vulgaris, Mæna vulgaris; Triest.—1907: Lecithaster.

stossichi Looss, 1907, 69, for stossichii Mont.—1907: Aphanurus (type).

subtenue Lint., 1907, 106, t. h. Calamus calamus, Harpe rufa, Iridio bivittatus, Lachnolaimus maximus; Bermuda.—1907: Dist.

syndosmyæ Pelseneer, 1906, 172, t. h. Syndosmya alba; Boulogne-sur-Mer.—1906: Cerc.

tenuicollis Rud., 1819. [See supra, p. 77.] Add: 1898: Campula.

tomex Lint., 1907, 112, t. h. Epinephelus striatus; Bermuda.—1907: Dist.

tornatum Rud., 1819. [See supra, p. 78.] Add: 1907: Dinurus (type).

triangulæ Linst., 1878, 72, for triangulare (Dist.).

trilobata Bory St.-Vincent, 1825a, 84, t. h. "infusions d'écorce de chêne."—1825: Furcocerca.

trimellaris Bosc, 1802a, v. 1, 262.—1802: Plan.

trulla Lint., 1907, 109, t. h. Ocyurus chrysurus; Bermuda.—1907: Dist.

ubiquita Lebour, 1907, 439, t. h. Littorina obtusata, L. rudis, Paludestrina stagnalis; Northumberland Coast.—1907: Cerc.

urna Grube & Wagener, 1852, 543, t. h. Chimæra monstrosa.—1852: Amphiptyches (type).—1896: Gyrocotyle. [Now in the Cestodaria.]

vallei Mont., 1907, 3, t. h. Chrysophrys aurata; Triest.—1907: Encotyllabe.

vaullegeardi Pelseneer, 1906, 175, t. h. Trochus cinerarius; Wimereux.—1906: Cerc.

virgula Looss, 1907, 111, t. h. Cepola rubescens, Engraulis encrasicholus; Triest.—1907: Aphanurus.

volgensis Linst., 1907, 201, t. h. Lucioperca sandra; Wolga.—1907: Ptychogonimus.

watsoni Conyngham, 1904. [See supra, p. 83.] Add: 1907: Gastrodiscus.

westermanni Rail., 1898, 173, for westermanii Kerbert, 1878. [See supra, p. 83.] Add: 1898: Clinost.

ADDITIONAL GENERIC AND SPECIFIC BIBLIOGRAPHY.

ACANTHOCOTYLE. [See above, p. 85.]

branchialis Willem, 1906, 599–607, figs. 1–10 (in Raie bouclée; Belgium).

AGAMODISTOMUM. [See above, p. 87.]

nanus Stiles & Goldberger, 1908, 30–33, figs. 45–64 (in Francolinus subtorquatus; Benguella, West Africa).

AMPHIPTYCHES Grube & Wagener, 1852, 543 (m. urna).

urna Grube & Wagener, 1852, 543–554 (in Chimæra monstrosa).

AMPHISTOMA. [See above, p. 89.]

bovium Nakahama, (1883b).—Teste Surg.-Gen. Cat.

dorsale Freund, 1907, 718, for chordale.

megalocotyle Walter, 1893, 19, 24, for megacotyle.

ropaloïdes Olss., 1867a, 19, 48, for ropaloides.

APHANURUS Looss, 1907, May 14, 591 (tod. stossichi), Hemiurinæ, Hemiuridæ; 1907, 69, 74, 78, 98, 107–109, 160.

stossichi (Mont., 1891) Looss, 1907, 591 (in Box boops, Caranx trachurus, Clupea pilchardus (t. h.), C. sardina, Lichia amia, Mæna vulgaris; Naples, Triest, t. l.); 1907, 69, 107, 109–111, 159, pl. 8, figs. 7, 8 (in Clupea aurita).

virgula Looss, 1907, May 14, 592 (in Cepola rubescens, Engraulis encrasicholus; Triest); 1907, 111, 159, pl. 9, figs. 15, 16.

APONURUS Looss, 1907, May 14, 607–608 (tod. laguncula), Lecithasterinæ, Hemiuridæ; 1907, 69, 74, 78, 99, 101, 111, 166–168.

laguncula Looss, 1907, May 14, 608 (in Belone acus, Lichia amia, Engraulis encrasicholus, Mullus barbatus, Cadus euxinus, Merlucius esculentus, Trachinus draco; Triest); 1907, 69, 110, 167, 169, pl. 13, figs. 53, 54, pl. 15, figs. 77, 78 (in Mæna vulgaris; Triest).

ASPIDOGASTER. [See above, p. 103.]

conchicala Nord., 1833b, 281, for conchicola.

BRACHILAIMUS Neumann, 1897f, 674, misprint for Brachylaimus. [See above, p. 116.]

BRACHYPHALLUS. [See above, p. 116.]

affinis Looss, 1907, 158–159, B. crenatus Rud. of Lander, 1904, renamed (in Anguilla chrysypa, Osmerus mordax; U. S. A.).

CALLYCOTYLE Mont., 1892a, 213, for Calicotyle. [See above, p. 119.]

CAMPULA. [See above, p. 120.]

albida (Braun, 1893) Rail., 1898, 172 (in cat and dog).

buski (Lankester, 1857) Rail., 1898, 172.

complexa (Stiles & Hass., 1894) Rail., 1898, 172 (in cat).

conjuncta (Cobbold, 1860) Rail., 1898, 172 (in Canidés).

conjuncta (of McConnell, 1875) Rail., 1898, 172 (in man).

conus (Crep., 1825) Rail., 1898, 172 (syn. Amphist. truncatum).—Reported for Phoca grœnlandica, P. vitulina.

sinensis (Cobbold, 1875) Rail., 1898, 172.

tenuicollis (Rud., 1819) Rail., 1898, 172 (syns. D. felineum, D. tenuicolle) (in cat and dog, Phoca).

(CEPHALOGONIMUS). [See above, p. 121.]

species Staff., 1902, 481.

CERCAREA Cobbold, 1873c, 14, for Cercaria. [See p. 121.]

CERCARIA. [See above, p. 121.]

appendiculata Pelseneer, 1906, 167, 174–175, 179, pl. 12, figs. 46–52 (in **Natica** alderi; Boulogne-sur-Mer).

brevicauda Pelseneer, 1906, 167, 179, 184, pl. 9, figs. 10, 11 (in **Littorina** rudis; Wimereux).

crispata Pelseneer, 1906, 171–172, 179, pl. 11, figs. 39–40 (in Natica alderi; Boulogne).

dentalii Pelseneer, 1906, 170, 171, 181, pl. 11, figs. 34, 35 (in **Dentalium** tarentinum).

emasculans Pelseneer, 1906, 166, 179, pl. 9, fig. 12 (in Littorina rudis; Wimereux).

giardi Pelseneer, 1906, 170–171, pl. 11, figs. 36–38 (in **Buccinum undatum**; Boulogne).

migocera Lebour, 1906, 7, for myocerca (in Scrobicularia tenuis).

minor Ben., 1858, 98, see armata minor.

myocercoides Pelseneer, 1906, 162–163, 179, pl. 8, figs. 1–2 (in **Syndosmya** alba; Boulogne-sur-Mer).

nigrotincta Pelseneer, 1906, 166, 179, pl. 9, fig. 9 (in Syndosmya alba; Boulogne-sur-Mer).

obtusicauda Pelseneer, 1906, 182, ?for obtusicaudata.

obtusicaudata Pelseneer, 1906, 167–168, 179, pl. 9, figs. 16–19, pl. 12, fig. 44 (in Natica alderi; Boulogne).

oocysta Lebour, 1907, 439, 440, 445–446, pl. 10, figs. E, F, G, (in Paludestrina stagnalis; Northumberland Coast).—Nicoll, 1907, 269.

parvirenalis Pelseneer, 1906, 165–166, 179, pl. 8, figs. 7, 8 (in Natica alderi; Boulogne).

pirum Lebour, 1907, 439, 440, 446–447, pl. 9, figs. F, G, (in Paludestrina stagnalis; Northumberland Coast).—Nicoll, 1907, 269.

seminis Owen, 1835l, 394.

species Lebour, 1906, 7 (in Donex vittatus, Tellina tenuis; Alnmouth Land).

species Lint., 1905d, 333, 401 (in Monacanthus hispidus; Beaufort, N. C.).

syndosmya Pelseneer, 1906, 172–173, 179, 185, pls. 10, 11, figs. 20, 21, 23 in Syndosmya alba; Boulogne-sur-Mer).—Giard, 1907, 419 (in Syndosmya alba).

ubiquita Lebour, 1907, 439, 440, 444–445, pl. 9, figs. D, E. (in Littorina obtusata, L. rudis, Paludestrina stagnalis; Northumberland Coast).

vaullegeardi Pelseneer, 1906, 175–176, 179, 180, pl. 11, figs. 41–43, 45 (in Trochus cinerarius; Wimereux).

CHELONELLA Ben. & Hesse, 1863, 80.—Mont., 1907, 6, syn. of Encotyllabe.

CHIORCHIS. [See above, p. 135.]

lunatus (Dies., 1836) Daday, 1907, 472.

papillatus Daday, 1907, 520–525, 534, 535, 536, 537, 538, 541, 542, 543, 545, 546, 547, 548, 550, 551, 552, 554, 555, 556, 557, 558, 561, 562, 564, 566, 567, 568, 570, 571, 572, 579, 581, 582, pl. 26, figs. 16, 17, 21, 24, 25, pl. 27, figs. 3, 4 (t. h. Colossoma brachypoma; Paraguay; also in Doras murica, Salmo pacu).

CLINOSTOMUM. [See above, p. 137.]

commutatum (Dies., 1850) Rail., 1898, 173 (in pigeonneaux, poulets).

heterophyes (Sieb., 1853) Rail., 1898, 173 (in chien, homme).

westermanni (Kerbert, 1871) Rail., 1898, 173 (in chat, chien, homme).

DACTYLOCOTYLE. [See above, p. 144.]

species Lint., 1905d, 333, 352, pl. 20, fig 151 (in Brevoortia tyrannus; Beaufort, N. C.).

DACTYLOGYRUS. [See above, p. 145.]

siluris glanidis Hofer, 1904a, 169, for siluri glanidis.

species Olss., 1883a, 53 (in Coregonus lavaretus).

DIACROCŒLIUM Neumann, 1897f, 673, misprint for Dicrocœlium.

DINURINÆ Looss, 1907, May 14, 592–593 (subf. of Hemiuridæ, contains: Dinurus, Ectenurus); 1907, 69, 99, 111–112, 125.

DINURUS Looss, 1907, May 14, 593 (tod. tornatus) [nec Dinoura Ashmead]; Dinurinæ, Hemiuridæ; 1907, 69, 99, 112–117, 123, 131

barbatus (Cohn, 1902) Looss, 1907, 594–596 (in Coryphæna equisetis, C. hippurus, Pelamys sarda); 1907, 118, 121, pl. 8, fig. 11, pl. 9, figs. 19, 20, 21.

breviductus Looss, 1907, May 14, 596 (t. h. Pelamys sarda; Atlantic Ocean; also in Coryphæna hippurus, at Beaufort, N. C.); 1907, 118–119, 120, 121, 122, pl. 8, fig. 12, pl. 10, figs. 22, 23.

longisinus Looss, 1907, May 14, 596 (in Coryphæna hippurus; Red Sea, near Aden); 1907, 86, 119–123, pl. 8, fig. 13, pl. 10, figs. 24, 25.

tornatus (Rud., 1819) Looss, 1907, 593–594 (in Coryphæna equisetis, C. hippurus, (t. h.) Pelamys sarda; Beaufort, N. C., Atlantic Ocean); 1907, 69, 112, 117, 120, 121, 122, pl. 8, figs. 9, 10; pl. 9, figs. 17, 18.

DIPLODISCUS. [See above, p. 155.]

cornu (Dies., 1839) Daday, 1907, 478–481, 527, 530, 533, 545, 546, 547, 549, 550, 551, 552, 554, 565, 568, 576, 581, pl. 24, figs. 11–15 (in Cataphractus vaça [= Doras] vaca; Rio Branco).

marenzelleri Daday, 1907, 473–478, 481, 527–530, 531, 532, 533, 546, 547, 548, 549, 550, 551, 552, 554, 564, 565, 568, 572, 576, 581, pl. 24, figs. 4–10 (in Salmo sp.; loc. South America, same as Amphist. oxycephalum).

DIPLOSTOMIASIS Hofer, 1904a, 138ff, refers to infection with Diplostomum.

DIPLOSTOMUM. [See above, p. 156.]

annuligerum (Nordm., 1832) Hofer, 1904a, 295, 296, fig. 189 (in Perca fluviatilis).

petromyzi fluviatilis Dies., 1858e, 316, for peteromyzi fluv.

DISTOMA. [See above, p. 159.]

betencourti Mont., 1892b, 127, pl. 8, fig. 12.

burki Rathelot, 1892a, 14 for buskii.

cignoides Desmonceaux, 1868a, 21, for cygnoides.

cylindriaccum Daday, 1907, 560, for cylindraceum.

fenestratum Lint., 1907, 111–112, pl. 12, figs. 86–91 (in Lycodontis moringa; Bermuda); includes Dist. sp. Lint., 1904, 373, figs. 213–214.

folium Olfers, 1816. [See supra, p. 190.]—Zschokke, 1884, 11, 50–52, pl. 2, fig. 11 (in Cottus gobio, Salmo umbla, Thymallus vulgaris, Trutta variabilis); 1896, 773, 774, 776, 780, 783, 820 (in Trutta fario, Cottus gobio).

gyrinus Lint., 1907, 107–108, pl. 10, figs. 72–74 (in Lactophrys tricornis, L. trigonus; Bermuda).

hæmatodium Dewitz, 1892b, 106, for hæmatobium.

hæmatobium Rathelot, 1892a, 14, 15, for hæmatobium.

lamelliforme Lint., 1907, 108–109 (in Balistes carolinensis, Lactophrys tricornis, L. trigonus; Bermuda).

levenseni Lint., 1907, 110, pl. 12, figs. 80–83 (in Epinephelus maculosis, E. striatus; Bermuda).

muehlingi Nicoll, 1907, 257, 259, for mühlingi.

noverca (Braun, 1902) Verdun, 1907, 274.

ophtalmobium Rathelot, 1892a, 14, for ophthalmobium.

pankreatikum Katsurada & Saito, Hyg. Centralbl., v. 3, Oct., 279, for pancreaticum.

preistis Mola, 1907, 39, for pristis.

quadrangulatum Daday, 1907, 470–472, pl. 24, figs. 1–3 (in Salmo pacu= Mycetes bidens; Cuyaba).

rajazzii Ariola, 1899, 135 to (Polyorchis), for ragazzii.

ranerium Nardo, 1833a, 523, for raynerianum.

similis (Jægers., 1900) Lebour, 1906, 6.

DISTOMA—Continued.

species Hausmann, 1899a, 448, 450 (in Gallus dom.).

species Hausmann, 1899a, 449 (in Corvus frugilegus.

species Schrœder, Hofer, 1904a, 285 (in Esox lucius).

species Lebour, 1905, 1–3, figs. A, C (in Cardium edule).

species Lebour, 1907, 102–104, pl. 7 (in Cardium edule; England).

species Lebour, 1907, 105–106, pl. 8, figs. C–D (in Patella vulgata).

species Lebour, 1907, 104–105, pl. 8, figs. A, B (in Purpura lapillus; England).

species Lint., 1905d, 335, 389, pl. 23, figs. 168, 169, 170 (in Bairdiella chrysura; Beaufort, N. C.).

species Lint., 1905d, 335, 403, pl. 29, fig. 208 (in Chilomycterus schœpfi; Beaufort, N. C.).

species Lint., 1905d, 335, 374 (in Coryphæna equisetis; Beaufort, N. C.).

species Lint., 1905d, 335, 373, pl. 30, figs. 213, 214 (in Coryphæna hippurus; Beaufort, N. C.).

species Lint., 1905d, 335, 385 (in Cynoscion regalis; Beaufort, N. C.).

species Lint., 1905d, 335, 350, pl. 29, fig. 209 (in Galeichthys milberti; Beaufort, N. C.).

species Lint., 1905d, 335, 382, pl. 24, fig. 179 (in Lagodon rhomboides; Beaufort, N. C.).

species Lint., 1905d, 335, 393 (in Leiostomus xanthurus; Beaufort, N. C.).

species Lint., 1905d, 335, 415 (in Lophopsetta maculata; Beaufort, N. C.).

species Lint., 1905d, 335, 360 (in Menidia menidia; Beaufort, N. C.).

species Lint., 1905d, 335, 397 (in Micropogon undulatus; Beaufort, N. C.).

species Lint., 1905d, 335, 410, pl. 22, fig. 167, pl. 29, fig. 205, pl. 30, fig. 215 (in Opsanus tau; Beaufort, N. C.).

species Lint., 1905d, 335, 413, 414 (in Paralichthys albiguttus; Beaufort, N. C.).

species Lint., 1905d, 335, 404, pl. 21, fig. 157 (in Prionotus scitulus; Beaufort, N. C.).

species Lint., 1905d, 335, 349, pl. 30, fig. 210 (in Pteroplatea maclura; Beaufort, N. C.).

species Lint., 1905d, 335, 372, pl. 23, figs. 171, 172 (in Rachycentron canadus; Beaufort, N. C.).

species Lint., 1905d, 335, 364, pl. 29, figs. 206, 207 (in Seriola lalandi; Beaufort, N. C.).

species Lint., 1905d, 335, 359 (in Siphostoma fuscum; Beaufort, N. C.).

species Lint., 1905d, 335, 402, pl. 22, fig. 165 (in Spheroides maculatus; Beaufort, N. C.).

species Lint., 1905d, 335, 361, pl. 30, fig. 211 (in Sphyræna borealis; Beaufort, N. C.).

species Lint., 1905d, 335, 353, pl. 22, fig. 166 (in Stolephorus brownii; Beaufort, N. C.).

species Lint., 1905d, 335, 416, pl. 22, figs. 161, 162, 163, 164, pl. 30, fig. 212 (in Symphurus plagiusa; Beaufort, N. C.).

species Lint., 1905d, 335, 366, pl. 29, fig. 204 (in Trachinotus carolinus; Beaufort, N. C.).

species Lint., 1907, 114, pl. 7, fig. 57 (in Angelichthys ciliaris; Bermuda).

species Lint., 1907, 117, pl. 12, fig. 84 (in Balistes carolinensis; Bermuda).

species Lint. 1907, 116, pl. 10, fig. 70 (in Bodianus fulvus punctatus; Bermuda).

species Lint., 1907, 115–116, pl. 10, fig. 69 (in Chætodon sp.; Bermuda).

species Lint., 1907, 117, pl. 13, fig. 85 (in Paranthias furcifer; Bermuda).

species Lint., 1907, 118 (in Salarichthys textilis; Bermuda).

species Lint., 1907, 114, pl. 8, figs. 59–60 to (Lecithocladium) (in Seriola dumerili; Bermuda).

DISTOMA—Continued.

species Lint., 1907, 113, pl. 7, figs. 55–56 (in Seriola fasciata; Bermuda).

species Lint., 1907, 116, pl. 10, fig. 70 (in Sphryæna sphryæna; Bermuda).

species Lint., 1907, 118 (in Teuthis cœruleus; Bermuda).

species Lint., 1907, 114–115, pl. 8, fig. 61 (in Teuthis hepatus; Bermuda).

species Lint., 1907, 115, pl. 8, fig. 62 (in Tylosurus acus; Bermuda).

species Olss., 1876a, 148 (in gall bladder of Larus argentatus).

subtenue Lint., 1907, 106, pl. 9, fig. 65 (in Calamus calamus, Harpe rufa, Iridio bivittatus, Lachnolaimus maximus; Bermuda).

tomex Lint., 1907, 112–113, pl. 14, figs. 94–96 (in Epinephelus striatus; Bermuda).

trulla Lint., 1907, 109, pl. 9, fig. 79 (in Ocyurus chrysurus; Bermuda).

DUCROCŒLIUM Neumann, 1897f, 659, misprint for Dicrocœlium.

ECHINOSTOMUM. [See above, p. 246.]

gazzettæ Arch. f. Naturg., 1901, v. 2 (8), 188, for garzettæ.

putorii (Schrank,? or Gmelin, 1790) Rail., 1898, 172 (syn. Fasc. trigonocephala) (in dog).

species Hausmann, 1899a, 448, 449, 452 (in Corvus frugilegus).

species Wolffhuegel, 1900, 35.

ECTENURUS Looss, 1907, May 14, 596–597 (tod. lepidus); Dinurinæ, Hemiuridæ; 1907, 69, 99, 123–124, 131, 153, 167.

lepidus Looss, 1907, 597 (t. h. Lichia amia; also in Atherina hepsetus, Caranx trachurus, Cepola rubescens, Lophius piscatorius, Mæna vulgaris, Scomber colias, Smaris alcedo, Trachypteron tænia); 1907, 69, 123, 124, pl. 10, figs. 26, 27, pl. 13, fig. 46.

ENCOTYLLABE. [See above, p. 251.]

paronæ Mont., 1907, 3, 4, 6, 7, 9–10, pl. 10, figs. 13–15 (in Crenilabrus pavo; Genova), E. sp. of Braun, Par. & Per., St. Remy.

species Lint., 1907, 103, pl. 7, figs. 49–53 (in Calamus calamus; Bermuda).

ralleti Mont., 1907, 3, 4, 6, 7, 10–11, pl. 10, figs. 4–9, 16 (in Chrysophrys aurata; Triest).

FASCIOLA. [See above, p. 254.]

egyptiaca Pease, 1901b, 7, for ægyptiaca.

jacksoni Cobbold, 1869a, 80, for jacksonii.

jaksoni Stazzi, 1900, 3, 4, 5, for jacksonii.

magna (Bassi, 1875) Sons., 1889, 275.

species Merrem, 1781, 169–172, pl. 1, figs. 3–7 (in mouse) "Sack-Egels."—Stiles & Stev., 1905a, 10 syn. of Tænia teniæformis.—Stiles, 1906a, 43, syn. of Cysticercus fasciolaris.

GASTEROSTOMUM. [See above, p. 270.]

baculatum Lint., 1907, 119, ?for baculum.

gracilius Pelseneer, 1906, 176, for gracilescens.

species Braun, 1893a, 866 (in Belone vulgaris, Cardium edule, C. rusticum, Ostrea edulis, Rochen, Haie).

species Lint., 1907, 119 (in Mycteroperca apua; Bermuda).

species Lint., 1905d, 335, 379 (in Orthopristis chrysopterus; Beaufort, N. C.).

species Lint., 1905d, 335, 364 (in Seriola lalandi; Beaufort, N. C.).

species Olss., 1869b, 498.

species Tennent, 1906, 640 (in Scomberomorus maculatus).

species Tennent, 1906, 640, 679, 682 (in Tylosurus marinus).

species Ziegler, 1883, 539 (in Cyclopterus lumpus).

GASTRODISCUS. [See above, p. 273.]

watsoni (Conyngham, 1904) Verdun, 1907, 285, fig. 110.

GASTROSTOMUM Otto, 1896a, 122, for Gasterostomum.

GYMNOPHALLUS. [See above, p. 276.]

dipsilis Nicoll, 1907, 247, 263–265 (in Oidemia fusca, O. nigra; Great Britain).

margaritarium (Dubois, 1901) Dubois, 1907, 502–504 (in Mytilus edulis, M. gallo-provincialis).—Giard, 1907, 419.

GYRODACTYLIASIS Hofer, 1904a, 134ff, name of infection.

HEMIURUS. [See above, p. 282.]

rugosus Looss, 1907, May 14, 591 (in Clupea pilchardus, C. sardina, Rhombus maximus; Triest); 1907, 105–106, 159, pl. 7, figs. 4, 5 (syn. H. stossichi Luehe, not Apoblema st. Mont., 1891).

HEXATHYRIDIUM. [See above, p. 286.]

sanguicola delle Chiaje, 1825a, 15 (syn. of Polyst. venarum).

HOLOSTOMUM. [See above, p. 289.]

cuculus Thoss, 1897, 1–66, pls. 1–2 (in Bursa fab. of Larus ridibundus; Kiel).—Kopczynski, 1907, 642.

HOLOSTONUM Thoss, 1897, 12, for Holostomum.

HOMALOGASTER. [See above, p. 294.]

philippinensis Stiles & Goldberger, 1908, 25–30, figs. 29–44 (in Bos sp.; Manila, P. I., Phrapatoom, Siam).

ITYOGONIMUS. [See above, p. 294.]

filum Looss, 1907, 606–607, figs. 2a–b (in Talpa europæa; Leipzig).

LECITHASTER. [See above, p. 295.]

galeatus Looss, 1907, May 14, 607 (in Mugil auratus; Egyptian Coast); 1907, 165–166, pl. 15, figs. 73, 74.

stellatus Looss, 1907, May 14, 606–607 (in Belone acus, Mæna vulgaris; Triest); 1907, 165, pl. 14, fig. 66, pl. 15, figs. 75, 76 (in B. a., Dentex vulg., M. v.).

LECITHOCHIRIUM. [See above, p. 295.]

gravidum Looss, 1907, May 14, 603 (t. h. Anguilla vulgaris; also in Gobius capito, Platessa passer, Rhombus maximus; Triest); 1907, 142, 148–149, pl. 14, figs. 60, 61, 63 (in A. v., Conger conger, Corvina nigra, G. c., Hippocampus guttulatus, Labrax lupus, P. p., R. m., Syngnathus acus; Triest).

LECITHOCLADIUM. [See above, p. 296.]

crenatum (Mol., 1859) Looss, 1907, 599 (in Centrolophus pompilius), perhaps n. sp.; 1907, 134–135, 169 (in C. p.; Triest).

cristatum (Rud., 1819) Looss, 1907, 598–599 (in Dactylopterus volitans; Naples; Stromateus fiatola; Rimini, Triest, Naples); 1907, 133–134, 135, 169, pl. 11, figs. 30, 31, pl. 13, figs. 44, 45 (in S. f.; Triest).

gulosum (Lint., 1901) Looss, 1907, 135 (in Rhombus (Stromateus, triacanthus; Woods Hole, U. S. A.).

LEVINSENIELLA. [See above, p. 299.]

macrophallos (Linst., 1875) Jægers., 1907, 148.

opaca (Ward, 1894) Jægers, 1907, 148.

pellucida Jægers., 1907, 134, 136, 141–144, 147–148, 150, 151, figs 6, 7 (in Anas boschas fera, Fuligula fuligula; West Coast of Sweden).

propinqua Jægers., 1907, 135–139, 140, 141, 142, 143, 144, 147–148, 150, figs. 1, 2, 3, 4, 5 (in charadrius hiaticula, Hæmatopus ostralegus; West Coast of Sweden).

MARITREMA Nicoll, 1907, 246, 265–266 (tod. gratiosum).

gratiosum Nicoll, 1907, 247, 248, 265, 266–267, 268, 269 (in Ægialitis hiaticula, Hæmatopus ostralegus, Larus ridibundus, (t. h.) Pelidna (Tringa) alpina; Great Britain).

humile Nicoll, 1907, 247, 266, 268–269 (in Totanus calidris; Great Britain).

lepidum Nicoll, 1907, 247, 266, 267–268 (in Larus argentatus; Great Britain).

MESOGONIMUS. [See above, p. 302.]

columbæ (Mazzanti, 1889) Mazzanti, 1890, 139.

MICROCOTYLE. [See above, p. 304.]

species Lint., 1905d, 335, 385 (in Cynoscion regalis; Beaufort. N. C.).

species Lint., 1905d, 335, 370, pl. 20, figs. 147–150 (in Pomatomus saltatrix; Beaufort, N. C.).

species Lint., 1907, 103–104 (in Calamus calamus, Diplodus sargus; Bermuda).

MICRORCHIS Daday, 1907, 481–482, 495, 526, 527, 528, 529, 530, 531, 533, 534, 535, 536, 538, 539, 540, 542, 545, 550, 552, 566, 567, 579, 580, 581 (type by present designation, on page precedence, megacotyle).

ferrum-equinum (Dies., 1836) Daday, 1907, 484, 485, 487, 488–494, 528, 530, 532, 533, 535, 537, 538, 539, 546, 547, 549, 553, 554, 556, 559, 561, 565, 576, 578, 581, pl. 24, figs. 27–29; pl. 25, figs. 1–6 (syn. Amphist. ferrum-equinum) (in Cataphractus corome, C. murica).

megacotyle (Dies., 1836) Daday, 1907, 482–488, 494, 527, 530, 532, 537, 546, 547, 549, 554, 561, 563, 565, 576, 578, 581, pl. 24, figs. 16–26 (syn. Amphist. megacotyle) (in Silurus palmito; Mattogrosso).

MONOSTOMUM. [See above, p. 308.]

lophocerca (Fil., 1857) Lebour, 1907, 439, 440, 443–444 (in Bythinia tentaculata, Paludestrina stagnalis; England).

species Lint, 1907, 118–119, pl. 14, figs. 92–93 (in Bathystoma striatum, Hæmulon flavolineatum; Bermuda).

species Nicoll, 1907, 247 (in Larus argentatus).

species Nicoll, 1907, 247 (in Oidemia fusca).

NITYCHIA Nord, 1833b, 384, for Nitzschia.

NITYSCHIA Nord., 1833b, 376, for Nitzschia.

OCTOBOTHRIUM. [See above, p. 324.]

melangi Lebour, 1907, 442, for merlangi.

species Olss., 1876a, 148 (in Thymallus vulgaris).

OPHECONA Looss, 1907, May 14, 616 (tod. bacillare).—Poche, 1907, Aug. 20, 103.

bacillare (Mol., 1859) Looss, 1907, May 14, 616.

PACHYTREMA Looss, 1907, 610 (tod. calculus).

calculus Looss, 1907, 610–613, figs. 3–4, Opisthorchiiden (in Larus argentatus, L. ridibundus; Triest).

PARAGOMINUS Daniels & Stanton, 1907, 343, for Paragonimus.

PARAGONIMUS. [See above, p. 335.]

heterophyes (Sieb., 1853) Neveu-Lemaire, 1904a, 73, 88, 89.

PARAPHISTOMUM Daniels & Stanton, 1907, 342, for Paramphistomum.

PARORCHIS. [See above, p. 337.]

acanthus (Nicoll, 1906) Nicoll, 1907, 247 (in Larus argentatus, L. canus).

PHYLLINE. [See above, p. 338.]

endorfii Par. & Per., 1895, 2, for heudorfii.

PHYLLODISTOMUM. [See above, p. 339.]

angulatum Linst., 1907, [2] 202, 1 fig. (in Lucioperca sandra; Wolga).

PLACOTREMA Looss, 1907, May 14, 615 (tod. inversum).

inversum Looss, 1907, May 14, 615 (in Chrysophrys aurata; Triest).

PLATYNOSUM Looss, 1907, 607 (tod. semifuscum).

semifuscum Looss, 1907, 607–608, fig. 3 (in Circetus [=Circætus?] gallicus; Genoa).

PLERURUS Looss, 1907, May 14, 604–605 (tod. digitatus), Sterrhurinæ, Hemiuridæ; 1907, 69, 78, 100, 152–153, 154.

digitatus (Looss, 1899) Looss, 1907, 605 (in Sphryæna vulgaris; Red Sea, Sawakin); 1907, 69, 152, 153–154, pl. 15, figs. 68, 69.

POLYSTOMA. [See above, p. 350.]

paguri Nord., 1833b, 379, see Bull. Soc. Philom., 1811, no. 44, 271, t. 2.

POLYSTOMIDÆS Mont., 1888a, 89, for Polystomidæ.

PRISTISOMUM Looss, 1907, May 14, 615 (tod. pumex).

caducum Looss, 1907, May 14, 615 (in Umbrina cirrhosa; loc. not given).—Poche, 1907, Aug. 20, 103.

pumex Looss, 1907, May 14, 615 (in Caranx trachurus; loc. not given).

PSEUDOCLADORCHIS Daday, 1907, 481 494–495, 526, 527, 528, 529, 530, 532, 533, 534, 536, 537, 541, 547, 549, 550, 552, 553, 554, 561, 565, 566, 567, 576, 580, 581 (type by present designation, on page precedence, cylindricus).

cylindricus (Dies., 1836) Daday, 1907, 495–501, 502, 503, 504, 506, 512, 530, 535, 538, 546, 554, 566, 579, pl. 25, figs. 7–16 (in Cataphracta murica, Salmo pacupeba, S. sp., Silurus megacephalus; Villa Maria, Brazil).

macrostomus Daday, 1907, 506–509, 530, 531, 535, 538, 546, 554, 566, pl. 26, figs. 8–12 (in Salmo pacupa, S. sp.; loc. South America, same as Amphist. oxycephalum).

nephrodorchis Daday, 1907, 501–506, 508, 509, 530, 535, 538, 546, 554, 566, pl. 25, figs. 17–22; pl. 26, figs. 1–7 (in Salmo pacu, S. pacupa, S. sp.; loc. South America, same as Amphist. oxycephalum).

PTYCHOGONIMUS. [See above, p. 357.]

volgensis Linst., 1907, 201 [1] (in Lucioperca sandra; Wolga).

SCHISTOSOMUM. [See above, p. 359.]

hæmatobium japonicum (Katsurada, 1904) Verdun, 1907, 290, 311, 313 (syn. of S. cattoi).

SCUTARIELLA Mrazek, 1907, 1–6, 1 pl., figs. 1–6 (m. didactyla).

didactyla Mrazek, 1907, 1–6, pl. 1, figs. 1–6 (in Atyaëphyra desmarestii; Moraca-Flusses, Scutarisee bei Plavnica).

SPOROCYSTIS. [See above, p. 362.]

cotti Zschokke, 1884, 6, 11, 56–58, pl. 2, fig. 13 (in Cottus gobio).

STERRURHINÆ Looss, 1907, 99, for Sterrhurinæ, see p. 364.

STROMYLOTREMA Poche, 1907, Aug. 20, 105, for Stomylotrema, see p. 365.

SYNCŒLIUM. [See above, p. 366.]

raggazzii Janicki, 1907, 719, for ragazzii.

TRISTOMA. [See above, p. 375.]

inermis Goto, 1899a, 273, see læve var. inermis.

UDONELLA. [See above, p. 381.]

caligarum Ben., 1858a, 1861a, 12, 13–18, pl. 1, figs. 1–15, for caligorum.

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TREASURY DEPARTMENT
Public Health and Marine-Hospital Service of the United States
WALTER WYMAN, Surgeon-General

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M. J. ROSENAU, Director
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THE INFLUENCE OF ANTITOXIN UPON POST-DIPHTHERITIC PARALYSIS

By
M. J. ROSENAU
and
JOHN F. ANDERSON

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THE INFLUENCE OF ANTITOXIN UPON POST-DIPHTHERITIC PARALYSIS.[a]

By M. J. ROSENAU,

Passed Assistant Surgeon, Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service,

and

JOHN F. ANDERSON,

Passed Assistant Surgeon, Assistant Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

INTRODUCTION.

Diphtheria, under various names, can be traced back to remote antiquity; but the specific contagious disease which we now call diphtheria was not differentiated until 1821, when Brétonneau[b] clearly described its clinical features and gave to it its present name. However, a definite relation between faucial attacks and subsequent paralysis was demonstrated almost one hundred years before.

Chomel,[c] dealing with the epidemic of Paris in 1743, Ghisi,[d] with that at Cremona in 1749, and Samuel Bard[e] with that of New York in 1789, described cases of paralysis following sore throat. It is a surprising fact that nearly a century elapsed before the remarkable observations of these three writers were confirmed by subsequent investigators.

Brétonneau,[f] in 1855, recorded an instance of post-diphtheritic paralysis in the case of Horpin, a surgeon of the hospital at Tours.

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[a] Manuscript submitted for publication June 14, 1907.

[b] Brétonneau: (a) Communication to the French Academy, 1821. (b) Des inflammations spéciales des tissus muqueux, et en particulier, de la diphtérite, ou inflammation pelliculaire. Paris, Crevot, 1826, 540 p., illus. 8°.

[c] These historical data are taken largely from J. D. Rolleston's excellent "Clinical observations on diphtheritic paralysis," The Practitioner, London, vol. 73, 1904, pp. 597–623, 794–824.

[d] Ghisi: Lettere mediche. Cremona, 1749.

[e] Bard, Samuel: An inquiry into the nature, cause and cure of the angina suffocativa, etc. Trans. Phil. Soc., Phila., 1789.

[f] Fifth memoir on diphtheria, 1855, New Sydenham Society, p. 182.

The first monograph on post-diphtheritic paralysis was by Maingault, of Paris, in 1854, which appeared as an inaugural thesis entitled "De la paralysie du voile du palais à la suite d'angine." Maingault's more important work, "Sur les paralysies diphtéritiques," appeared in 1860. Between 1854 and 1860 several isolated cases of diphtheritic palsies had been described by observers, especially by Trousseau, who by this time had collected 90 cases, 29 of which were in children, with a mortality of 12.

The first histological investigations as to the nature of diphtheritic paralysis were made by Charcot and Vulpian[a] in the case of a woman who had died with palatal paralysis. They showed that the motor nerves alone were affected, and consisted of tubules entirely devoid of medullary substance. The neurilemma contained numerous granular cells, mostly elliptical in shape and in some cases nucleated. A few of the muscle fibers were fatty. The sensory nerves showed no signs of alteration.

In 1883 Klebs[b] found very peculiar and striking bacteria constantly present in the pseudo-membranes in the throats of those dying of true epidemic diphtheria. The next year Löffler[c] isolated these organisms in pure culture and produced more or less characteristic pseudo-membranes by inoculating the cultures upon the mucous membranes of susceptible animals, frequently causing characteristic lesions with death.

In 1888 Roux and Yersin[d] published their notable "contributions to the study of diphtheria." They were the first to prove that paralysis is a common sequel in the lower animals after recovery from experimental diphtheria. They observed the palsies in pigeons and rabbits following pharyngeal and tracheal inoculation. They also observed the same sequel in rabbits recovering from intravenous inoculations. Roux and Yersin concluded that the existence of these palsies following the inoculation of the Klebs-Löffler bacillus completes the resemblance between the experimental and the natural disease and establishes the specific rôle of this bacillus.

The introduction of the antitoxin treatment in 1894, followed by an increase in the number of palsies observed, has led to the publication of several monographs and experimental work dealing with the subject.

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[a] Comp. rend. Soc. biol., 1862.

[b] Klebs: Congrès de Wiesbaden, 1883. Arch. f. exper. Path., I and IX. Also, "Verhandlungen des Congresses für innere Med.," 1883.

[c] Löffler: Untersuchungen über die Bedeutung der Mikroorganismen für die Entstehung der Diphtherie biem Menschen. Mitt. a. d. kais. Gesundheitsamte, Bd. 2, 1884.

[d] Roux, E., and Yersin, A.: Contribution à l'étude de la diphtérie. Ann. de l'Inst. Pasteur, vol. 2, 1888, p. 629.

The school founded by Ehrlich [a] in 1897, based on his scholarly work upon the constituents of the diphtheria poisons, and methods of standardizing the antitoxic value of the curative serum, made much use of the post-diphtheritic paralyses produced experimentally in the guinea pig. Ehrlich believes that at least two primary poisons are produced by the growth and multiplication of the diphtheria bacillus in nutrient broth; the one, *toxin*, produces acute death within about four days; the other, *toxon*, is incapable of causing acute death, but is responsible for the late palsies. In accordance with Ehrlich's view, post-diphtheritic paralysis is a *toxon* poisoning.

Ehrlich [b] has recently (1906) given a forcible defense of his classical paper entitled "The constituents of diphtheria toxin." On account of its importance in connection with our work, a brief summary of Ehrlich's views bearing upon diphtheritic paralysis or toxon poisoning is given practically in his own words, as follows:

We are evidently dealing with a primary secretory product of the diphtheria bacilli, the "toxon." The toxon possesses the same haptophore group as the toxin, but a weaker affinity for the antitoxin. The main difference is in the toxophore group, for even when given in large doses the toxon does not produce death, but only paralyses, which develop after a long incubation of fourteen days or more.

The presence of an independent poison (toxon) was inferred by Ehrlich from the curves shown in the spectra, which are based upon the assumption that 1 immunity unit contains 200 combining units.

The independent existence of the toxons is further corroborated by the fact that the toxon zone varies enormously in different specimens of poison. In one it may amount to about one-fifth of the toxin portion; in another he has seen equal parts of toxon and toxin. Dreyer and Madsen in fact have recently described a poison which contained three times as much toxon as toxin. According to our present experiences, therefore, the amount of toxon calculated on the toxin can vary from 0 per cent to 300 per cent.

This still left undecided whether the toxon is a primary bacillary secretion or secondary modification of the toxin. A study of the development of one poison (poison V) finally gave Ehrlich a clue to this. (Poison V has been described in the Deut. med. Woch., 1898.)

This particular toxine remained constant, as far as the L+ dose was concerned, but the L^0 dose increased considerably, from 0.125 to 0.21. Ehrlich explains this phenomenon by assuming that the toxin portion remained absolutely unchanged, as indicated by the constancy of the L+ dose. On the other hand, the toxon portion, which is expressed by the difference between the L+ and the L^0 dose, disappeared. This eliminates the possibility of the transformation of toxin into toxon.

It is difficult to say, a priori, what becomes of the toxon which has disappeared. Ehrlich assumes that we are dealing with a formation of an analogue of toxoid, viz, a substance which he terms toxonoid. This he conceives to be a toxon in which the toxophore group has become modified.

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[a] Ehrlich, P.: Die Wertbemessung des Diphtherieheilserums und deren theoretische Grundlagen. Klin. Jahrb., Jena, v. 6 (2), 1897, pp. 299–326.

———: Ueber die Constitution des Diphtheriegiftes. Deut. med. Woch., Leipzig, v. 24 (38), 1898, pp. 597–600.

[b] Ehrlich, Paul: Studies on immunity. XXXVII, The constituents of diphtheria toxin. New York, John Wiley & Sons, 1906, p. 481.

Another fundamental difference—one which in Ehrlich's opinion argues in favor of the individuality of toxin and toxon—consists in the different action of the two constituents. The action of diphtheria toxin, as is well known, is such that the animals die with lesions of hydrothorax, ascites, congestion of the suprarenals, necrosis of the skin. Somewhat smaller doses kill guinea pigs in from six to seven days, the animals showing ulceration and extensive necrosis. Still smaller doses—$\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{8}$, $\frac{1}{8}$ L. D.—no longer produce death, but regularly cause necroses, which are surrounded by an extensive area of total loss of hair. Small fractions of the fatal dose always produce emaciation of the animals. In contrast to this, the toxon—i. e., a serum-poison mixture in which only the toxin fraction is completely neutralized—never kills animals acutely, even in high doses. The inflammatory properties may be entirely absent in small doses, while in large doses they are present to only a slight degree. The œdema disappears completely in the course of a few days, there are no necroses, and the loss of hair, if it occurs at all, is only partial. On the other hand, the paralyses are very characteristic, and these appear at any time between the fourteenth and twentieth days, depending upon the dose, usually in the third week. Frequently the animals do not show even a trace of local reaction, and maintain their weight; then suddenly they are attacked with the paralyses and may die from these within a few days. Ehrlich has never seen such a result in animals inoculated with a pure diphtheria poison. Now and then a guinea pig was observed which showed these paralytic phenomena. It was usually one that had received a considerable fraction of the L. D. Invariably it showed extensive necroses, was generally very sick from the beginning, and had suffered considerable loss of weight. In view of the slight amount of toxon which was found in these poisons, such animals were evidently supersensitive to the toxon.

Ehrlich believes that the diphtheria poison contains at least three different varieties of poison and that these possess different affinities and different actions. These poisons are:

1. Toxin, possessing the highest affinity, kills rabbits and guinea pigs acutely, but is more toxic for the former.
2. Toxon, killing rabbits acutely and guinea pigs with symptoms of paralysis.
3. Toxonoid, producing paralyses in rabbits; nontoxic for guinea pigs.

The fact that all three poisons act more strongly on rabbits than on guinea pigs is explained by the absolute higher susceptibility of the former.

Upon the constituents of diphtheria toxin Ehrlich sums up his views as follows:

1. The diphtheria bacillus produces several kinds of poison, especially toxins and toxons.
2. The affinity of diphtheria toxin to the antitoxin is very great.
3. The deviations from a straight line as they manifest themselves in the graphic representation of the neutralization of the poison can not be explained by the assumption of a single poison possessing a weak affinity. They are rather the expression of the fact that the poison bouillon contains admixtures of various kinds of substances of a toxoid character.
4. The varied affinity of the toxoids can not be explained by the assumption that a simple toxin when transformed into toxoid suffers a change in affinity either positively or negatively. Rather does this indicate that the toxic bouillon contains, preformed, various toxins of different affinities.
5. There is no change in the haptophore group in the formation of toxoid.
6. The absolute number of combining units contained in the immune unit or in the L^0 dose of poison is 200.

POST-DIPHTHERITIC PARALYSIS IN MAN.

Paralysis probably follows in one-fourth of all cases of diphtheria that recover. The palsies are frequently so slight in degree and extent that they may readily be overlooked. Of 50,851 cases observed from 1895 to 1902 in the hospitals of the Metropolitan Asylums Board 19.54 per cent developed post-diphtheritic paralysis.

Post-diphtheritic paralysis follows both mild and severe cases; even fatal paralysis may follow an ambulatory case.[a] Both sexes are equally affected. While the palsies follow the attacks of diphtheria in all ages, clinicians differ radically as to the relative frequency of the sequel at different ages.

The paralysis may affect the heart, palate, ciliary muscle (loss of accommodation), ocular muscles (strabismus), the pharynx, lips, diaphragm, or any of the skeletal muscles. It is sometimes localized, sometimes general.

The paralysis may more properly be described as a palsy or paresis, as the loss of power is seldom complete. It usually appears about the second or third week, sometimes as late as the eighth week. According to Rolleston, early paralysis indicates a profound intoxication of the nervous system and is a bad prognosis, early involvement of the palate being often associated with cardiac paralysis. This corresponds precisely with our observations upon the guinea pig. Paralysis appearing early in the guinea pig—between the thirteenth and eighteenth days following infection—is almost invariably severe and fatal; paralysis appearing later is commonly benign.

The tendency of diphtheritic palsy is to recover. When death occurs it is usually within the first three weeks, and is commonly due to cardiac paralysis. The figures indicate that from 2 to 4 per cent of the total number of cases of diphtheria die as a result of post-diphtheritic paralysis.

A precocious form of palatal palsy occurring about the fifth day of the disease or earlier has been described. Deguy[b] believes these early palsies of the palate to result from the local effect of inflammatory reactions other than diphtheria. The presence of large numbers of diplococci, both in the leucocytes and in the thrombosed capillaries of the part, adds weight to the belief that the action is a diplococcæmia superadded to a diphtheritic intoxication.

Rolleston believes that precocious palatal palsy in diphtheria is almost invariably associated with malignant forms, as is shown by

[a] This corresponds to our work upon guinea pigs. Mixtures containing large doses of toxin partially saturated with antitoxin, when injected into guinea pigs, may cause little or no acute symptoms, but there may be enough uncombined "toxon" to cause severe or fatal post-diphtheritic paralysis.

[b] Rev. neurology and psychia., vol. 4, Sept., 1906, p. 614.

the high mortality, the association of other grave symptoms during the acute stage, and subsequent more frequent development of paralysis in convalescence in the cases in which it occurs. It resembles the ordinary forms of diphtheritic palsy in its tendency to be frequently incomplete and by its higher incidence among young persons. It is, as a rule, of much longer duration than the palatal affection which occurs at a later date.

THE RELATION OF POST-DIPHTHERITIC PARALYSIS TO ANTITOXIN.

The statement is frequently made that paralysis is even more common in the cases treated with antitoxin than under former methods of treatment.

Welch[a], 1895, thinks this doubtful; if true, it may be attributed to the survival of a larger proportion of the cases.

McCollom[b], 1905, drawing from his rich experience with diphtheria at the Boston City Hospital, states that, although paralysis occurs after the severe cases, it has not been so frequent as it would have been in an equal number of cases treated without antitoxin.

Marfan[c], at the Hôpital des Enfants Malades de Paris, where over 1,000 young diphtheria patients are treated annually, is of the opinion that since the introduction of antidiphtheric serum paralysis has become much less frequent. It seems, however, that the cases are not kept under observation long enough at this hospital to warrant such a strong conclusion.

Variot,[d] 1898, dismisses the subject briefly by saying that paralyses are not rarer after serum treatment than before, but present the same localization, the same clinical characters, and the same duration as before.

Weill and Deguy[e] distinguish two kinds of paralysis: The first including paralysis of the palate and larynx, which they admit is still very frequent, but according to them is less due to diphtheritic intoxication than to local inflammation. The second group includes paralysis of the limbs, eyes, and viscera, which is due to the action of the diphtheria toxine and is much less frequently met with since the introduction of antitoxin.

Rolleston believes that the most satisfactory answer to this question is given by the statistics published annually by the Metropolitan Asylums Board. The yearly admission to its fever hospitals of

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[a] Welch, W. H.: The treatment of diphtheria by antitoxin. Bull. Johns Hopkins Hosp., July–Aug., 1895, vol. 6, Nos. 52 and 53, p. 1119.

[b] McCollom, J. H.: Boston med. and surg. journ., vol. 152, 1905, pp. 621–632.

[c] Clinique Infantile, May 15, 1904.

[d] La diphtérie et la sérumthérapie, 1898.

[e] Traitement de la diphtérie, 1902.

diphtheria patients is considerable and each case is, as a rule, kept long enough for paralysis to develop:

Year.	Number admitted.	Percentage of paralysis cases.
1893	2,848	14.2. Pre-antitoxin year.
1894	3,666	13.1. Only a few cases injected.
1895	3,635	20.4. General employment of antitoxin.
1896	4,508	20.5.
1897	5,637	20.55.
1898	6,566	19.42.
1899	7,066	20.0.
1900	7,195	18.50.
1901	6,926	15.0.
1902	6,534	17.07.
1903	5,072	17.1.
1904	4,687	14.8.
1905	4,148	12.4.
1906	5,218	10.9.

It is plain from the above figures that while the percentage of paralysis during the years following the introduction of antitoxin is higher than in 1893 and 1894, in recent years a decrease is evident; this is probably due to larger dosage and earlier administration of serum. The medical superintendents of these hospitals pointed out in 1895 that there is more than one explanation of the increase first noted. In the first place, cases that before would have died in the acute stage now survive and suffer those palsies which before were found only in the less severe cases. Secondly, the new treatment aroused fresh interest in diphtheria and stimulated more careful clinical observation.

Rolleston expresses the emphatic opinion that antitoxic treatment does not make paralysis more liable to ensue. He states that the early administration of antitoxin makes paralysis less likely to occur, especially in the severe form. He gives the following figures in support of his views:

Day of the disease.	Paralysis cases.	Percentage.	Severe forms only.	Percentage.
First day	1	5.5	0	0.0
Second day	16	15.09	4	3.7
Third day	28	18.7	8	5.3
Fourth day	27	28.7	12	12.7
Fifth day	21	35.0	5	8.3
Sixth day	15	34.9	10	23.2
Seventh day	4	19.4	1	4.7
Ninth day	1	50.0	0	.....
Eleventh day	1	50.0	1	50.0
Thirtieth day	1	100.0	1	50.0
Total	115	.....	41	.....

Rolleston fully appreciates and emphasizes the importance of early administration and large dosage in diminishing the incidence, especially in a severe form of subsequent paralysis. In severe cases Rolleston uses 18,000 to 24,000 units, usually repeated once, sometimes twice, by injections on following days. The mildest cases receive early from 3,000 to 12,000 units.

There is no definite proof that post-diphtheritic paralysis ever occurs in cases treated with antitoxin within the first twenty-four hours of the disease. This corresponds precisely with what we see in the guinea pig. Paralysis may follow in cases treated with serum on the second and third day of the disease, again an exact duplicate of the picture we see in the guinea pig.

This emphasizes the importance of administering this soveriegn remedy early. But if the case is not seen early, can larger doses prevent the occurrence of post-diphtheritic paralysis and save life?

It seemed to Ransom,[a] 1900, worth while to undertake an examination into the conditions under which diphtheritic paralysis occurs in animals and to ascertain by means of experiments what effect, if any, the antitoxin has on this very disagreeable sequel to an attack of diphtheria. As a result of his work Ransom concludes that—

1. Paralysis may certainly be expected after intoxication with not less than one-fourth of the fatal dose. With doses between one-fourth and one-eighth paralyses occur but are not constant, and below one-eighth no paralysis was noticed.

2. The larger the dose of toxine the severer will be the paralysis, if the animal survives long enough.

3. Neutralized mixtures of toxine and antitoxine, containing only about one lethal dose or less, do not appear to cause paralysis.

4. Antitoxine given fifteen to twenty-two hours after intoxication, with doses of toxine not greater than the lethal dose, exercises in large doses a mollifying influence on the subsequent paralysis. This influence is more evident on smaller doses of toxine than on such as are but little less than the minimal fatal dose. Small doses of antitoxine have no evident effect in diminishing the paralysis.

5. Transferring these results to practice among human beings, we may expect liberal doses of antitoxine, given early in the illness, to influence favorably the subsequent paralysis, and this beneficial influence is likely to manifest itself not so much on the local paralysis (soft palate, etc.) as on such symptoms as failure of the heart. Severe cases are, however, likely to be followed by some paralysis in spite of even large doses of antitoxine.

POST-DIPHTHERITIC PARALYSIS IN THE GUINEA PIG.

Diphtheria in the guinea pig closely resembles the same disease in man. Post-diphtheritic paralysis in the guinea pig is an almost exact counterpart of the same complication in man. We are, therefore,

[a] Ransom, F.: Diphtheritic paralysis and antitoxine. Journ. path. and bact., 1900 vol. 6, p. 397.

able to bring forward experimental evidence showing the relation of antitoxin to post-diphtheritic paralysis.

It is now well known that guinea pigs may develop paralysis following the injection of a sublethal dose of toxine or the injection of a toxine-antitoxin mixture in which the toxine is but partially neutralized. As will be seen by our experiments, paralysis may unerringly be produced in guinea pigs with a partially neutralized toxine. We look upon the paralysis as a "toxon" poisoning.

By no means every guinea pig that shows symptoms of post-diphtheritic paralysis dies. Recovery from this sequel in the guinea pig is frequent and depends entirely upon the amount of toxon in the toxine-antitoxin mixture. It is very easy to mix the toxine and antitoxin in such proportion that every guinea pig will develop post-diphtheritic paralysis and die. By adding a little more antitoxin or a little less toxine to the mixture the guinea pigs will develop mild paralytic symptoms from which almost all will recover.

Almost all of our work was done with partially neutralized mixtures containing sufficient toxon to produce early and malignant paralysis. As far as the guinea pig is concerned paralysis can rarely be detected before the fourteenth day. The first indications are a softness of the abdominal muscles near the site of the injection. The weakness gradually spreads to the extremities and finally to the muscles of respiration. In the guinea pig paralysis occurring early is almost always followed by death; symptoms appearing late are apt to be mild, and complete recovery follows.

We can confirm the observations of Lewis,[a] in that the paralysis in the guinea pig may be slight, affecting but one limb or somewhat embarrassing the respiration; or, it may be severe and cause sudden or gradual death. It may last for two days or two weeks, or it may terminate fatally at any time. The paralysis is never permanent.

Lewis [a] recently made a study of diphtheria toxone paralysis in the guinea pig, and concludes as follows:

1. By grouping and analyzing the records of the guinea pigs used in a large number of routine tests of the strength of recently prepared toxins it is shown that the crude toxins, produced by the same culture of diphtheria bacillus under conditions which are identical within limits which it is possible to determine at the present time, differ greatly in the amount of toxon or paralysis-producing poison which they contain.

2. Using old crude toxins which have become relatively stable in composition, in mixtures with antitoxin on the present Ehrlich system, it is shown that—

(*a*) Guinea pigs are somewhat more susceptible to the action of

[a] Lewis, Paul A.: Diphtheria toxon paralysis in the guinea pig. Journ. med. research, vol. 15, no. 3, n. s., vol. 10, no. 3, Dec., 1906, pp. 469–482.

toxon during the winter months than during the summer. A variation probably dependent on the kind of food supplied and possibly also on the ventilation of their quarters.

(*b*) Guinea pigs of increased resistance to the "toxin" fraction of the poison produced by the diphtheria bacillus also show a well-marked increase in resistance toward toxon. That is, they are less frequently afflicted with paralysis than are animals of normal resistance when treated with unsaturated but nonfatal toxin-antitoxin mixtures.

3. For guinea pigs of normal resistance at least the nearer the L+ dose is approached, supposing the animal to survive the necessary length of time, the greater the chance of paralysis developing.

CAN ANTITOXIN INFLUENCE DIPHTHERITIC PARALYSIS AFTER THE PARALYSIS HAS APPEARED?

Antitoxic serum has been extensively used in France as a curative agent for this sequel and many cases of complete recovery have been reported following its use, after the appearance of paralytic symptoms.

Comby,[a] 1904, claims never to have lost a case after its administration. Recently (August, 1906), Comby[b] reports further cases illustrating the value of antidiphtheritic serum in the treatment of diphtheritic paralysis. He advocates the free use of the serum whether or not it had been previously used in the treatment of the primary disease. He used 10 to 20 cubic centimeters of the French serum according to age, repeated daily for three, four, or five days if necessary.

Rolleston,[c] commenting on Comby's report, points out that the mortality of post-diphtheritic paralysis has always been very low and intimates that the reported cases of cure after the administration of antidiphtheritic serum would have recovered as quickly without it.

From our own experimental evidence obtained upon guinea pigs it seems to us useless to give diphtheria antitoxic serum to control the paralysis *after the paralysis has appeared.*

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[a] Comby, J.: Paralysies diphtherique queries par le sérum. Arch. de med. enf., Paris, vol. 7, 1904, pp. 411–417.

[b] Comby, J.: Paralysie diphtérique guérie par le sérum. Arch. de med. enf., vol. 9, no. 8, August, 1906, pp. 480–484.

——: Traitement des paralysies diphtheriques. Bull. et mem. soc. med. de hop. de Paris, 3 s., vol. 23, no. 21, June 21, 1906, pp. 626–631.

[c] Rolleston, J. D.: Lancet, July 7 and Sept. 24, 1906.

We injected a number of guinea pigs with 400 or 500 units of antitoxin during various stages of paralysis. These pigs had all been given toxine-antitoxin mixtures for the purpose of testing the strength of various serums bought on the open market in accordance with the law of July 1, 1902.[a]

It will be seen from Table 1 that the antitoxin apparently had no influence at all to save life or ameliorate the symptoms when given during the stage of paralysis.

[a] An act to regulate the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes. Approved July 1, 1902.

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TABLE No. 1.—GUINEA PIGS TREATED WITH ANTITOXIN WHILE PARALYZED.

P=Paralysis.
B P=Beginning paralysis.
M P=Mild paralysis.
C P=Complete paralysis.

+=Death.
400=400 units of antitoxin subcutaneously.
500=500 units of antitoxin subcutaneously.

Guinea pig No.	Toxin-antitoxin mixture injected subcutaneously.	Day after injection of the toxin-antitoxin mixture.																
		17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	35.
7566	0.142 c. c. toxine No. 5 + $\frac{1}{480}$ c. c. P. D. 07635		B P 400	P	P	P	P	P	P	+										
7534	0.142 c. c. toxine No. 5 + $\frac{1}{480}$ c. c. P. D. 08021			B P 400	P	+														
7494	0.24 c. c. toxine No. 9 + $\frac{1}{480}$ c. c. P. D. 08516							B P	P 400	P	P	P	P	P	P	P	P	+		
7481	0.24 c. c. toxine No. 9 + $\frac{1}{480}$ c. c. S.-68 D							B P	P 400	+										
7530	0.142 c. c. toxine No. 5 + $\frac{1}{340}$ c. c. P. D. 08021			B P 500	P	+														
7539	0.142 c. c. toxine No. 5 + $\frac{1}{470}$ c. c. P. D. 08021			B P 500	P	P	+													
7577	0.142 c. c. toxine No. 5 + $\frac{1}{850}$ c. c. P. D. 07635		B P 500	P	P	P	P	P	P	P	P	+								
7528	0.142 c. c. toxine No. 5 + $\frac{1}{400}$ c. c. P. D. 08021			M P 400	P	P	+													
7532	0.142 c. c. toxine No. 5 + $\frac{1}{340}$ c. c. P. D. 08021			M P 400	P	+														
7533	0.142 c. c. toxine No. 5 + $\frac{1}{480}$ c. c. P. D. 08021			M P 400 +																
7588	0.142 c. c. toxine No. 5 + $\frac{1}{1000}$ c. c. N. Y. B. H. 305-6	M P 400	P	P	P	P	+													
7519	0.142 c. c. toxine No. 5 + $\frac{1}{480}$ c. c. P. D. 08021			M P 500	P	P	+													

7526	0.142 c. c. toxine No. 5 + 1/40 c. c. P. D. 08021			M P 500	P	P	P	+										
7544	0.142 c. c. toxine No. 5 + 1/140 c. c. M. 2100			M P 500	P	P	P	P	P	P	P	P	+					
7596	0.142 c. c. toxine No. 5 + 1/60 c. c. A. 245		M P 500	P	P	P	P	P	+									
7483	0.24 c. c. toxine No. 9 + 1/130 c. c. M. 2100								C P 400	P	P	P	+					
7538	0.142 c. c. toxine No. 5 + 1/420 c. c. P. D. 08021			C P 400 +														
7540	0.142 c. c. toxine No. 5 + 1/40 c. c. P. D. 08021			C P 400	P	P	P	+										
7543	0.142 c. c. toxine No. 5 + 1/160 c. c. M. 2100			C P 400	P	P	P	P	P	P	P	P	+					
7587	0.142 c. c. toxine No. 5 + 1/1800 c. c. N. Y. B. H. 305–6	C P 400	P	P	P	+												
7385	0.142 c. c. toxine No. 5 + 1/1120 c. c. N. Y. B. H. 305													C P 500	P	P	P	+
7518	0.142 c. c. toxine No. 5 + 1/380 c. c. P. D. 08021			C P 500	P	+												
7522	0.142 c. c. toxine No. 5 + 1/340 c. c. P. D. 08021			C P 500	P	+												
7575	0.142 c. c. toxine No. 5 + 1/240 c. c. P. D. 07635		C P 500	+														
7583	0.142 c. c. toxine No. 5 + 1/280 c. c. P. D. 07635		C P 500	P	+													
7585	0.142 c. c. toxine No. 5 + 1/260 c. c. P. D. 07635		C P 500	+														

CAN ANTITOXIN INFLUENCE DIPHTHERITIC PARALYSIS WHEN INJECTED SHORTLY BEFORE THE PARALYSIS DEVELOPS?

The following tests show that the administration of 400 units of antitoxin, given fifteen days after the injection of a partially neutralized dose of toxine and five to six days before paralysis appeared, can not control the appearance of the symptoms or save life. Further experimental proof of this will be found in Tables Nos. 3 and 4. Guinea pigs Nos. 7930 and 7929 are illustrations of toxon poisoning with complete recovery.

TABLE No. 2.—THE EFFECT OF ANTITOXIN WHEN INJECTED SHORTLY BEFORE SYMPTOMS APPEAR.

Guinea pig No.	Toxine-antitoxin mixture.	Paralysis.	Result.
7899	0.24 c. c. toxine No. 9+$\frac{1}{10}$ c. c. Stearns No. 1500.	Paralysis began about 20th day. (Control).	Death, 26th day.
7900	0.24 c. c. toxine No. 9+$\frac{1}{10}$ c. c. Stearns No. 1500.	Paralysis began about 20th day=400 units antitoxin 15th day.	Death, 23d day.
7930	0.24 c. c. toxine No. 9+$\frac{1}{15}$ c. c. N. Y. B. H. 310.	Paralysis began about 24th day. (Control).	Recovered.
7929	0.24 c. c. toxine No. 9+$\frac{1}{15}$ c. c. N. Y. B. H. 310.	Paralysis began about 21st day=400 units antitoxin 15th day.	Recovered.
7925	0.24 c. c. toxine No. 9+$\frac{1}{15}$ c. c. N. Y. B. H. 310.	Paralysis began about 20th day. (Control).	Death, 25th day.
7926	0.24 c. c. toxine No. 9+$\frac{1}{15}$ c. c. N. Y. B. H. 310.	Paralysis began about 20th day=400 units antitoxin 15th day.	Death, 25th day.
7924	0.24 c. c. toxine No. 9+$\frac{1}{15}$ c. c. N. Y. B. H. 310.	Paralysis began about 20th day. (Control).	Death, 25th day.
7923	0.24 c. c. toxine No. 9+$\frac{1}{15}$ c. c. N. Y. B. H. 310.	Paralysis began about 21st day=400 units antitoxin 15th day.	Death, 25th day.

HOW LONG AFTER THE INFECTION CAN ANTITOXIN INFLUENCE PARALYSIS?

A number of tests were undertaken to determine this important point. The first series of guinea pigs were all given an L+ dose of toxine partially neutralized so that all of them, if untreated, as shown by the controls, would have developed paralysis between the thirteenth and fourteenth days and died on the twentieth to the twenty-fifth day.

Each guinea pig in Table No. 3 received a mixture containing 0.142 c. c. of our toxine No. 9, which is the L+ dose of this poison, plus $\frac{1}{10}$ c. c. of antitoxic horse serum. The minimal lethal dose of this toxine is 0.006. Each guinea pig, therefore, received 24 minimal lethal doses. The toxine and antitoxin were mixed and allowed to

stand one hour at room temperature before being injected into the guinea pig.[a] Not one of the 50 guinea pigs receiving this mixture died acutely of *toxin* poisoning.

All the guinea pigs receiving an injection of 250 units of the diphtheria antitoxin at intervals of 4, 8, 12, 16, and 20 hours after infection were protected against paralysis. The two guinea pigs (Nos. 8124 and 8125) receiving 250 units of antitoxin twenty-four hours after infection developed slight paralysis on the twenty-fifth day; later than the controls. They made a complete recovery.

The guinea pigs (Nos. 8138, 8139, and 8140) which received 2,000 units of antitoxin twenty-four hours after infection developed very slight paralysis, from which they recovered. It was noticeable that the guinea pigs which received 2,000 units twenty-four hours after infection developed a somewhat milder type of paralysis than those which received 250 units.

Further, the guinea pigs (Nos. 8130 and 8131) receiving repeated injections of 250 units beginning 24 hours after infection developed but slight paralysis.

From the first series we also learn that 1 unit of antitoxin given before or at the time of infection is sufficient to prevent the development of paralysis. On the other hand, as much as 2,000 units, given 24 hours after infection, did not prevent the development of this sequel, although it modified the severity of the palsy and saved life.

[a] For details of the technic, see Hygienic Laboratory Bulletin No. 21, "The immunity unit for standardizing diphtheria antitoxin (based on Ehrlich's normal serum); official standard prepared under the act approved July 1, 1902." M. J. Rosenau.

TABLE No. 3.—THE EFFECT OF ANTITOXIN, GIVEN AFTER INFECTION, UPON THE DEVELOPMENT OF PARALYSIS.

(FIRST SERIES.)

P = Paralysis.
+ = Death.

1; 250; 1,000; 2,000 = Units of antitoxin injected subcutaneously.

[Each guinea pig received a subcutaneous injection = 0.142 c. c. toxine No. 9 + $\frac{1}{180}$ c. c. antitoxic horse serum (S. 1110).]

Guinea pig No.	Units of antitoxin given.										Days after the injection of the toxine-antitoxine mixture.																						Result.
	24 hours before.	At once.	4 hours after.	8 hours after.	12 hours after.	16 hours after.	20 hours after.	24 hours after.	36 hours after.	48 hours after.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	31.	32.	33.	34.	
8153												P	P	P	P	P	P	P	P	P	P	P	+										+ Control.
8154												P	P	P	P	P	P	P	P	P	+												+ Control.
8155												P	P	P	P	P	P	P	P	P	P	P	+											+ Control.
8156												P	P	P	P	P	P	P	P	P	P	P	+											+ Control.
8157											P	P	P	P	P	P	P	+																+ Control.
8106	1																																	No paralysis. Recovered.
8107	1																																	No paralysis. Recovered.
8108	250																																	No paralysis. Recovered.
8109	250																																	No paralysis. Recovered.
8110		1																																No paralysis. Recovered.
8111		1																																No paralysis. Recovered.
8112		250																																No paralysis. Recovered.
8113		250																																No paralysis. Recovered.
8114			250																															No paralysis. Recovered.
8115			250																															No paralysis. Recovered.
8116				250																														No paralysis. Recovered.
8117				250																														No paralysis. Recovered.
8118					250																													No paralysis. Recovered.
8119					250																													No paralysis. Recovered.
8120						250																												No paralysis. Recovered.

8121				250																												No paralysis. Recovered.
8122					250																											No paralysis. Recovered.
8123					250																											No paralysis. Recovered.
8124						250																	P	P	P	P	P	P	P	P	P	P	Slight paralysis of hind legs. Recovered.
8125						250																	P	P	P	P	P	P	P	P	P	P	Slight paralysis of hind legs. Recovered.
8132	1,000																															No paralysis. Recovered.
8133	1,000																															No paralysis. Recovered.
8134	1,000																															No paralysis. Recovered.
8144		2,000																														No paralysis. Recovered.
8145		2,000																														No paralysis. Recovered.
8135			2,000																													No paralysis. Recovered.
8136			2,000																													No paralysis. Recovered.
8137			2,000																													No paralysis. Recovered.
8146				2,000																												No paralysis. Recovered.
8147				2,000																												No paralysis. Recovered.
8148					2,000																											No paralysis. Recovered.
8149					2,000																											No paralysis. Recovered.
8138						2,000																			P	P	P	P	P	P	P	P	Very slight paralysis. Recovered.
8139						2,000																			P	P	P	P	P	P	P	P	Very slight paralysis. Recovered.
8140						2,000																			P	P	P	P	P	P	P	P	Very slight paralysis. Recovered.
8126	250	250	250	250	250	250	250	250																								No paralysis. Recovered.
8127	250	250	250	250	250	250	250	250																								No paralysis. Recovered.
8128			250	250	250	250	250	250																								No paralysis. Recovered.
8129			250	250	250	250	250	250																								No paralysis. Recovered.
8130						250	250	250																	P	P	P	P	P	P	P	P	Slight paralysis. Recovered.
8131						250	250	250																	P	P	P	P	P	P	P	P	Slight paralysis. Recovered.

Each guinea pig of the second series (Table No. 4) received the same mixture of toxine and antitoxin as those of the first series.

We learn from this series that three guinea pigs (Nos. 7948, 7949, and 7950) which received 250 units of antitoxin twenty-four hours after infection had paralysis but recovered. In two of them (Nos. 7949 and 7950) the paralysis came on later than in the controls, viz, on the nineteenth day. It is therefore plain that the antitoxin given twenty-four hours after infection had the power of modifying the paralysis and saving the life of these animals.

We learn next that 250 units of antitoxin given forty-eight hours or more after infection totally failed to modify the paralysis or save the lives of the guinea pigs (Nos. 7951, 7952, and 7953).

The animals which received 250 units of antitoxin daily beginning twenty-four hours after infection (Nos. 7978, 7979, and 7980) developed paralysis late and benign in type. The symptoms appeared on the seventeenth, twentieth, and twenty-sixth days, respectively. All three recovered. Here again the antitoxin undoubtedly modified the severity of the paralysis and saved the lives of these pigs.

The guinea pigs which received 250 units of antitoxin daily beginning forty-eight hours after infection nicely demonstrate the importance of using the serum early. Two (Nos. 7981 and 7982) developed paralysis on the seventeenth and twentieth days, respectively, and recovered. The other one (No. 7983) developed paralysis on the fifteenth day and died despite the administration of 1,250 units of antitoxin. Therefore it is plain that antitoxin given forty-eight hours after infection and in large doses may fail to influence the paralysis or save life. However, when given as late as the fourth or fifth day after infection and in repeated doses it seemed to exert some favorable action, for it will be noticed that guinea pigs Nos. 7984 to 7992 developed symptoms on the average several days later than the controls; in one case (No. 7986) death was delayed, and in another case (No. 7988) the animal recovered.

TABLE No. 4.—THE EFFECT OF ANTITOXIN, GIVEN AFTER INFECTION, UPON THE DEVELOPMENT OF PARALYSIS.

(SECOND SERIES.)

P = Paralysis. + c = Chloroformed.
+ = Death. 250 = Subcutaneous injection of 250 units antitoxic serum.

[Each guinea pig received a subcutaneous injection: 0.142 c. c. toxine No. 5 + $\frac{1}{100}$ c. c. antitoxic horse serum (S. 1100).]

Guinea pig No.	Days following the injection of the toxine-antitoxin mixture.																											Result.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	
7943															P	P	P	P	P	P	P	P	P	+c							+ Control.
7944														P	P	P	P	P	P	P	P	P	P	+							+ Control.
7945														P	P	P	P	P	P	P	P	P	P	+c							+ Control.
7946													P	P	P	P	P	P	P	P	P	P	P	+							+ Control.
7947														P	P	P	P	P	P	P	P	P	P	+							+ Control.
7948	250													P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	Recovered.
7949	250																		P	P	P	P	P	P	P	P	P	P	P	P	Recovered.
7950	250																		P	P	P	P	P	P	P	P	P	P	P	P	Recovered.
7951		250												P	P	P	P	P	P	+c											+
7952		250													P	P	P	P	P	+c											+
7953		250															P	P	P	+c											+
7954			250											P	P	P	P	P	+												+
7955			250											P	P	P	P	P	P	+c											+
6			250												P	P	P	P	P	+c											+
				250										P	P	P	P	P	P	P	P	P	P	+c							+
8				250										P	P	P	P	P	P	+c											+
				250										P	P	P	P	P	P	+c											+
					250									P	P	P	P	P	P	+c											+
1					250							P	P	P	P	P	P	P	P	+c											+
2					250												P	P	P	P	P	P	P	+c							+
						250						P	P	P	P	P	P	P	P	+c											+
4						250								P	P	P	P	P	P	+c											+
5						250								P	P	P	P	P	P	+c											+

TABLE No. 4.—THE EFFECT OF ANTITOXIN, GIVEN AFTER INFECTION, UPON THE DEVELOPMENT OF PARALYSIS—Con.

Guinea pig No.	Days following the infection of the toxine-antitoxin serum.																												Result.
	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	30.	
7966							250							P	P	P	P	P	P	+c										+
7967							250							P	P	P	P	P	P	+c										+
7968							250																	P	P	P	P	+			+
7969								250				P	P	P	P	P	P	+													+
7970								250									P	P	P	P	P	P	P	+c							+
7971								250											P	P	P	P	+								+
7972									250			P	P	P	P	P	P	+													+
7973									250			P	P	P	P	P	P	P	P	+c											+
7974									250										P	P	P	P	P	+c							+
7975										250							P	P	P	+c											+
7976										250							P	P	P	+c											+
7977										250				P	P	P	P	P	P	+c											+
7978	250	250	250	250	250	250	250	250	250	250																P	P	P	P	P	Recovered.
7979	250	250	250	250	250	250	250	250	250	250							P	P	P	P	P	P	P	P	P	P	P	P	P	P	Recovered.
7980	250	250	250	250	250	250	250	250	250	250										P	P	P	P	P	P	P	P	P	P	P	Recovered.
7981		250	250	250	250	250	250	250	250	250							P	P	P	P	P	P	P	P	P	P	P	P	P	P	Recovered.
7982		250	250	250	250	250	250	250	250	250										P	P	P	P	P	P	P	P	P	P	P	Recovered.
7983		250	250	250	250	250	250	250	250	250					P	P	P	P	P	P	P	P	P	+c							+
7984			250	250	250	250	250	250	250	250									P	P	P	P	P	+c							+
7985			250	250	250	250	250	250	250	250							P	P	P	P	P	P	P	+c							+
7986			250	250	250	250	250	250	250	250										P	P	P	P	P	P	P	P	P	P	+	+
7987				250	250	250	250	250	250	250							P	P	P	P	P	P	P	+c							+
7988				250	250	250	250	250	250	250										P	P	P	P	P	P	P	P	P	P	P	Recovered.
7989				250	250	250	250	250	250	250										P	P	P	P	+c							+
7990					250	250	250	250	250	250							P	P	P	P	P	P	P	+c							+
7991					250	250	250	250	250	250										P	P	P	P	+c							+
7992					250	250	250	250	250	250										P	P	P	P	+c							+

In Table No. 5, in which is shown the third series of guinea pigs given very large doses of antitoxin at varying times following the subcutaneous inoculation of the toxine-antitoxin mixture, we find that only the three guinea pigs (Nos. 8183, 8184, and 8185) which received the antitoxin twenty-four hours after infection recovered. The paralysis in these three pigs was so transient and slight in degree that its existence was open to some doubt in our minds, and is therefore not recorded in the table.

We confess to some disappointment that the guinea pigs receiving such massive doses of antitoxin as 4,000 units forty-eight hours after infection became paralyzed and died. (Nos. 8186, 8187, and 8188.) In Table No. 4 it appears that two of the three guinea pigs receiving repeated doses of antitoxin beginning forty-eight hours after infection recovered, and we were led to hope that one very large dose given forty-eight hours after infection would modify the paralysis more favorably than was actually the case with the guinea pigs in Table No. 5. This emphasizes more forcibly the importance of giving antitoxin early. It should be remembered that 4,000 units of antitoxin for a guinea pig weighing 250 grams is an enormous dose and would represent about 400,000 units for a 50-pound child.

TABLE NO. 5.—THE EFFECT OF ANTITOXIN, GIVEN AFTER INFECTION, UPON THE DEVELOPMENT OF PARALYSIS.

(THIRD SERIES.)

P = Paralysis. 250; 1,000; 4,000 = Units of antitoxin injected subcutaneously.
+ = Death.

[Each guinea pig received a subcutaneous injection of 0.142 c. c. toxine No. 5 + $\frac{1}{100}$ c. c. antitoxic horse serum (S. 1100).]

Guinea pig No.	Units of antitoxin given. 24 hours after.	48 hours after.	72 hours after.	96 hours after.	5 days after.	6 days after.	7 days after.	Day after injection of the toxine-antitoxin mixture. 12.	13.	14.	15.	16.	17.	18.	19.	20.	21.	22.	23.	24.	25.	26.	27.	28.	29.	Remarks.
8177										P	P	P	P	P	P	P	P	P	P	+						
8178														P	P	P	P	P	P	P	P	P	P	+		
8179									P	P	P	P	P	P	P	P	P	P	P	P	+						
8180									P	P	P	P	P	P	P	P	P	P	P	P	+						
8181															P	P	P	P	P	+							
8182										P	P	P	P	P	P	P	P	P	+								
8183	250																									Very slight paralysis, if any.
8184	1,000																									Do.
8185	4,000																									Do.
8186		4,000															P	P	P	P	P	P	P	+		
8187		4,000							P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	P	+	
8188		4,000												P	P	P	P	P	P	P	P	+				
8189			4,000														P	P	P	P	P	+				
8190			4,000											P	P	P	P	P	P	P	P	P	P	P	+	
8191			4,000						P	P	P	P	P	P	P	P	P	+								
8192				4,000											P	P	P	P	P	P	P	P	P	P	+	
8193				4,000				P	P	P	P	P	P	P	+											
8194				4,000															P	P	P	P	P	P	+	
8195					4,000				P	P	P	P	P	P	P	P	P	P	P	+						
8196					4,000				P	P	P	P	P	P	P	P	P	P	+							
8197					4,000						P	P	P	P	P	P	P	P	P	P	P	+				

8198						4,000				P	P	P	P	P	P	P	P	+								
8199						4,000										P	P	P	P	P	P	P	+			
8200						4,000													P	P	P	P	P	P	P	P	+
	72 hours after.	80 hours after.	96 hours after.	104 hours after.	120 hours after.	128 hours after.	144 hours after.	152 hours after.	168 hours after.																	
8204	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000									P	P	P	P	P	+			
8205	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000	4,000						P	P	P	P	P	P	P	+				
8206			4,000	4,000	4,000	4,000	4,000	4,000	4,000		P	P	P	P	P	P	P	P	P	+						
8207			4,000	4,000	4,000	4,000	4,000	4,000	4,000		P	P	P	P	P	P	P	P	P	P	P	P	+			

Our results upon the guinea pig correspond with the statistics of post-diphtheritic paralysis in man following treatment with antitoxic serum. We would, however, expect antitoxin when given in massive doses to have a more favorable influence upon paralysis in man than in guinea pigs, for the reason that our experimental animals received 24 minimal lethal doses of toxine but partially neutralized with antitoxic serum. This produces an early and fatal form of paralysis. In man this malignant form but rarely follows cases that have recovered from diphtheria. If, then, we are able to modify or control this sequel and save life in the guinea pig by using antitoxin forty-eight hours after infection we could expect a like beneficial result in man to follow the use of antitoxin a longer period after the onset of illness. We gave our guinea pigs the extreme charge of toxine at once; in man the toxine is doubtless elaborated and absorbed more slowly. Therefore, the following figures are significant:

Petit[a] found that in 48 cases of paralysis observed at the Hôpital des Enfants malades, following diphtheria, treated with serum, the following:

Cases treated about the 2nd day, 6.25 per cent developed paralysis.
Cases treated about the 3rd day, 19 per cent developed paralysis.
Cases treated about the 4th day, 24.70 per cent developed paralysis.
Cases treated about the 7th day, 38.70 per cent developed paralysis.

Monti[b] states that of the cases treated—

About the 3rd day of the disease, 8 per cent developed paralysis.
About the 4th day of the disease, 12 per cent developed paralysis.
About the 5th day of the disease, 33.3 per cent developed paralysis.
About the 6th day of the disease, 50 per cent developed paralysis.
About the 7th day of the disease, 66.2 per cent developed paralysis.

Reichsfald[c] says that of cases treated—

About the 2nd day of the disease, 25 per cent developed paralysis.
About the 3rd day of the disease, 33 per cent developed paralysis.
About the 5th day of the disease, 50 per cent developed paralysis.

See also Rolleston's cases, page 13.

CAN ANTITOXIN, GIVEN BEFORE INFECTION AS A PROPHYLACTIC, PREVENT POST-DIPHTHERITIC PARALYSIS?

Although we have but limited data upon this question we are enabled to answer it affirmatively. Even so small a quantity as one unit, given to a guinea pig twenty-four hours before the injection of

[a] Petit, Rene: Note sur 48 cas de paralysis diphtheretique. Rev. mens. mal. enf., vol. 15, 1897, p. 76.

[b] Monti., Wiener med. Woch., 1895, no. 4 and 5.

[c] Reichsfald. Revue hebdomadaire 1895 no. 6 (text in Russian).

a toxine-antitoxin mixture containing sufficient *toxon* to invariably cause paralysis in control animals, is sufficient to prevent the development of paralysis and save life (see guinea pigs Nos. 8106, 8107, 8110, and 8111, Table No. 3).

SUMMARY AND CONCLUSIONS.

Post-diphtheritic paralysis in the guinea pig is an almost exact counterpart of the same sequel in man. We are therefore able to bring forward experimental evidence showing the effect of antitoxin upon post-diphtheritic paralysis.

In the guinea pig antitoxin can not influence the diphtheritic paralysis after the paralysis has appeared.

Antitoxin has no influence in preventing post-diphtheritic paralysis if injected shortly before the paralysis develops.

Antitoxin given twenty-four hours after the infection can save the life of the guinea pig and greatly modify the paralysis.

Antitoxin given in a single large dose forty-eight hours after the infection did not modify the paralysis or save life. Thus, in our experiments 4,000 units failed to modify the paralysis or save the life of guinea pigs weighing about half a pound. Weight for weight this corresponds to 400,000 units for a 50 pound child.

Antitoxin given in repeated injections beginning twenty-four or forty-eight hours following infection seems to have a more favorable effect upon the subsequent paralysis than a single injection.

A very small quantity (1 unit) of antitoxin given twenty-four hours before or at the time of infection in our experiments prevented the development of paralysis.

In man we would expect more favorable results from the use of antitoxin than our work upon the guinea pig indicates, for we were dealing with an early and malignant form of experimental post-diphtheritic paralysis. This grave variety is, fortunately, rare in man. Further, we injected the entire charge of the poison directly into the tissues of the guinea pig, while in man the toxine is doubtless elaborated more slowly. We may therefore assume that antitoxic serum, given at a somewhat later period than in our work upon guinea pigs, would exert beneficial effects.

The fact that one unit of antitoxin prevents paralysis and saves life when administered timely, whereas 4,000 units totally fails when delayed 48 hours, emphasizes the importance of using this sovereign remedy early.

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The Hygienic Laboratory was established in New York, at the Marine Hospital on Staten Island, August, 1887. It was transferred to Washington, with quarters in the Butler Building, June 11, 1891, and a new laboratory building, located in Washington, was authorized by act of Congress, March 3, 1901.

The following *bulletins* [Bulls. Nos. 1–7, 1900 to 1902, Hyg. Lab., U. S. Mar.-Hosp. Serv., Wash.] have been issued.

No. 1.—Preliminary note on the viability of the *Bacillus pestis*. By M. J. Rosenau.

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No. 6.—Disinfection against mosquitoes with formaldehyd and sulphur dioxid. By M. J. Rosenau.

No. 7.—Laboratory technique: Ring test for indol, by S. B. Grubbs and Edward Francis; Collodium sacs, by S. B. Grubbs and Edward Francis; Microphotography with simple apparatus, by H. B. Parker.

By act of Congress approved July 1, 1902, the name of the "United States Marine Hospital Service" was changed to the "Public Health and Marine-Hospital Service of the United States," and three new divisions were added to the Hygienic Laboratory.

Since the change of name of the Service the bulletins of the Hygienic Laboratory have been continued in the same numerical order, as follows:

No. 8. Laboratory course in pathology and bacteriology. By M. J. Rosenau. (Revised addition March, 1904.)

No. 9. Presence of tetanus in commercial gelatin. By John F. Anderson.

No. 10. Report upon the prevalence and georgaphic distribution of hookworm disease (uncinariasis or anchylostomiasis) in the United States. By Ch. Wardell Stiles.

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No. 36.—Further studies upon hypersusceptibility and immunity. By M. J. Rosenau and John F. Anderson.

No. 37. Index-catalogue of medical and veterinary zoology. Subjects: Trematoda and trematode diseases. By Ch. Wardell Stiles and Albert Hassall.

No. 38.—The influence of antitoxin upon post-diphtheritic paralysis. By M. J. Rosenau and John F. Anderson.

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TREASURY DEPARTMENT
Public Health and Marine-Hospital Service of the United States
WALTER WYMAN, Surgeon-General

HYGIENIC LABORATORY.—BULLETIN No. 39
M. J. ROSENAU, Director
JULY, 1907

THE ANTISEPTIC AND GERMICIDAL PROPERTIES OF SOLUTIONS OF FORMALDEHYDE AND THEIR ACTION UPON TOXINES

By
JOHN F. ANDERSON

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1907

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THE ANTISEPTIC AND GERMICIDAL PROPERTIES OF SOLUTIONS OF FORMALDEHYDE AND THEIR ACTION UPON TOXINES.

INTRODUCTION.

Since the discovery by Loew and Fischer, in 1886, of the germicidal action of formic aldehyde, a large amount of work has been done with the substance, both as a gas evolved by various means and in the watery solution.

The recent work by McClintic (1) seems to have established its limitations when used as a gas. The great variation in the results of various workers in regard to its action as a germicide and antiseptic in its watery solution has led me to try to determine its real value. The need of an efficient and, at the same time, a safe and comparatively cheap disinfectant is great, especially for the disinfection of the excreta of persons sick with infectious diseases. For this purpose the agent should be rapid in its action, an efficient deodorant, comparatively cheap, and safe to handle. Formic aldehyde in solution, in my opinion, comes nearer to fulfilling these conditions than any other agent we have at the present time.

In the minds of the laity, a deodorant is more or less synonymous with a germicide, but of course a deodorant may be almost valueless as a disinfectant, and, on the other hand, a disinfectant may possess but slight deodorizing properties. In the use of an agent for the disinfection of excreta, etc., it is important that the person using it understands just what is meant when told to disinfect the discharge with a 5 per cent solution. It may be understood that a 5 per cent solution of the agent is to be added to the discharge, while what is really meant is that the agent shall be in the proportion of 5 parts in 100 of the total volume under treatment. Of course it is needless to say that there must be a thorough mixture of the agent and of the material to be disinfected, and that they must remain in contact a sufficient length of time for the maximum action of the germicide to be exerted. While, for example, a 2 per cent solution might kill typhoid bacilli in thirty minutes, it might take a 1 per cent solution an hour or longer.

A number of samples of different solutions of formic aldehyde were analyzed to determine the exact percentage of the aldehyde contained

therein and quite a variation in the percentage was noted. The highest was 52 per cent, which was in a sample sent by a manufacturer, but it soon decreased to 43; the lowest was 29 per cent.

Bernard Smith (2) examined 29 samples and the lowest percentage he found was 32.45 per cent and the highest 39.11 per cent, the average of the 29 samples being approximately 37 per cent. My work was done with solutions varying from 37.2 per cent to 37.4 per cent and will be discussed in percentages of formalin, the name by which the watery solution is best known, of about 37.2 per cent formic aldehyde.

To Passed Asst. Surg. M. J. Rosenau I am much indebted for suggesting this study and for suggestions as to the work. Also, to Dr. J. H. Kastle and Asst. Surg. Norman Roberts, who very kindly collected for me most of the data on methods of preparation and tests.

PROPERTIES AND USES.

Formalin or solution of formaldehyde is an aqueous solution containing not less than 37 per cent, by weight, of absolute formaldehyde (U. S. P.). Formalin is a clear, colorless liquid with a sharp, penetrating odor, caustic taste, and is very irritating to the mucous membranes. It mixes with alcohol and water in all proportions. When subjected to low temperatures it becomes turbid, due to the formation of paraformaldehyde. It is not corrosive to the metals, except unpolished steel and iron. It combines readily with albumin, and its germicidal action is due to its combination with the cell body of the bacterium.

It is used to some extent for tanning leather. Its use as a preservative of cadavers in embalming fluids is wide. It enters into the composition of Orth's and Kaiserling's solutions, and is frequently used for fixing of specimens in microscopical work. It has been used illegally for the preservation of various food products, especially milk and cream. It is also used to some extent by farmers for the destruction of harmful fungi, such as smut on seed grain and scab on potatoes.

The gas evolved by various methods from the solution is one of our most efficient gaseous disinfectants.

According to Fischer 2 cubic centimeters of a $\frac{1}{1000}$ formalin solution per 100 grams of body weight given intraperitoneally will kill guinea pigs. In whatever way it is introduced into the body it is capable of producing lesions in the parenchymatous organs.

DISCOVERY AND METHODS OF PREPARATION.

Formic aldehyde was first obtained by Hoffman (3) in 1867. He made it by passing the vapors of methyl alcohol, laden with air, over a heated platinum spiral.

In 1875 J. Volhard (4) obtained it in the following manner: A coil of platinum wire was heated in the flame of a wood spirit lamp. The

flame was then extinguished and the slow oxidation of the alcohol was allowed to proceed. Solutions containing ½ per cent of the aldehyde were thus prepared.

In 1881 Kabloukoff (5) prepared large amounts of the aldehyde by passing mixtures of air and methyl alcohol through a glass tube filled with platinized asbestos and heated in a combustion furnace.

In 1884 Tollens (6) prepared the aldehyde by passing air and the vapors of methyl alcohol, heated to 55° C., over platinum foil, and concentrating the distillates by a second distillation. In this manner he obtained solutions containing 11.3 per cent of the aldehyde, and by drying over sulphuric acid he obtained the pure compound.

O. Loew (7) in 1886 devised the following method for the preparation of the aldehyde: A current of dry air is drawn as quickly as possible through a half-liter flask half filled with methyl alcohol and then through a hard glass tube 30 cm. long, containing a cylinder of coarse copper gauze 5 cm. long, and then successively through an empty flask of 300 to 400 c. c. capacity and two flasks half filled with water. The part of the glass tube containing the copper gauze is surrounded with brass gauze and gently heated. When the alcohol vapor reaches the copper gauze the latter glows more or less according to the rate of the current of air passing over it. When the apparatus has once gotten in proper working order the process requires no further attention beyond keeping up the supply of alcohol, and the apparatus may be left running night and day. A 15 per cent to 20 per cent solution of formic aldehyde was obtained in this way. Tollens (6) in 1886 obtained still better results by passing the air through methyl alcohol that had been heated to 45°–50° C. and by substituting for platinum foil a coil of copper gauze, omitting the condenser and maintaining a constant stream of air. In this way he was able to obtain 30 per cent to 40 per cent solutions of the aldehyde with ease, and found that 30 per cent of the methyl alcohol burned was converted into the aldehyde.

In 1890 W. Eschweiler (8) employed essentially the same method as Tollens and Loew. He found that the best yield is obtained by keeping the copper gauze at such a low red heat that it only could be seen to glow in the dark. In the first receiver he obtained a 40 per cent solution of formic aldehyde, and the mixed solutions from all the receivers were found to contain from 17 per cent to 18 per cent of formic aldehyde.

In 1886 Loew and Fischer (9) discovered that formic aldehyde possesses powerful antiseptic properties. Since these earlier observations the germicidal action of formic aldehyde has been investigated by Trillat, Buchner, Aronson, Cohn, and others. As the result of these studies, formic aldehyde has come to be used on a large scale as a disinfectant and deodorizer, and the commercial methods used in the

manufacture of 40 per cent solutions of this compound are based on the methods already set forth in the above. These methods, however, are secret processes protected by chemical patents, and hence are not described in the literature.

TESTS.

The following is an outline of the most important methods now in use for the detection and determination of formaldehyde. Those most favorably mentioned in the literature are briefly described.

At the present time formaldehyde is extensively employed as an antiseptic, germicide, and food preservative. Methods therefore have been devised whereby it may be detected and determined (a) in strong solutions, such as formalin; (b) as a gas in the atmosphere of closed spaces, and (c) in admixture with various other substances, usually of an organic nature, such as milk and other foodstuffs.

The following qualitative methods are said to be the most delicate and trustworthy:

Hehner's (10) and its modifications. Bring into contact without mixing two layers, the bottom one of concentrated sulphuric acid, the top one of milk suspected of containing formaldehyde. Richmond and Boseley (11) dilute the milk with its own volume of water, which tends to prevent charring. A purple color at the zone of contact indicates formaldehyde. The casein of the milk is one of the reagents. The test can be applied to substances other than milk by the addition to the liquid to be tested of formaldehyde-free milk or certain other proteids, the best, according to Acree (12), being a globulin extracted from squash seeds. Adding to the acid a solution of ferric chloride (Lyons, 13) or solid potassium chloride (Luebert, 14) is also said to be an improvement.

Lebbin's (15). Boil a few c. c. of the liquid with 0.05 G. of resorcinol and about an equal volume of 50 per cent sodium hydroxide solution. The yellow color changes to red.

Rimini's (16). Directly applicable to foods, especially milk. To 15 c. c. of the substance are added successively 1 c. c. of dilute phenylhydrazine hydrochloride solution, a few drops of fresh sodium nitroprusside solution, and a few drops of caustic soda solution. A blue color is produced, turning finally red.

Hydrochloric acid test (51). Commercial hydrochloric acid (specific gravity 1.2) containing 2 c. c. of 10 per cent ferric chlorid per liter is used as a reagent. Add 10 c. c. of the acid reagent to an equal volume of milk in a porcelain casserole and heat slowly over the free flame nearly to boiling, holding the casserole by the handle and giving it a rotary motion while heating to break up the curd. The presence of formaldehyde is indicated by a violet coloration, varying in depth with the amount present. In the absence of formaldehyde the solution

slowly turns brown. By this test 1 part of formaldehyde in 250,000 parts of milk is readily detected before the milk sours. After souring, the limit of delicacy proves to be about 1 part in 50,000. Various aldehydes when introduced into milk give color reactions under the above treatment, but formaldehyde alone gives the violet coloration, which is perfectly distinguishable and unmistakable.

According to Leach this seems to be a most satisfactory test.

The following quantitative methods are generally considered to be the best:

Romijn's (17) cyanide method. The formaldehyde solution is added to an excess of potassium cyanide solution, and this mixture is at once poured into an excess of silver nitrate solution, which contains enough nitric acid to maintain an acid reaction throughout. The formaldehyde combines quantitatively with the cyanide to form the compound $CH^2O.KCN$, the excess of the cyanide reacts with the silver nitrate to form silver cyanide, and the excess of the silver nitrate left in the solution is titrated with ammonium sulphocyanate.

Romijn's (18) iodometric method. To the formaldehyde solution are added 25 c. c. of decinormal iodine solution, followed by enough strong sodium hydroxide solution to make the mixture pale yellow. Allow to stand ten minutes (some authorities say longer), and then add concentrated hydrochloric acid until the reaction is slightly acid. Titrate for free iodine with sodium thiosulphate. Each two atoms of iodine consumed represents one molecule of formaldehyde.

Blank and Finkenbeiner's (19). To a carefully weighed amount of the formaldehyde solution are added normal sodium hydroxide solu tion, followed at once, drop by drop, by neutral hydrogen peroxide. When the reaction is completed, the excess of alkali is titrated with normal sulphuric acid. Modifications suggested by Schoorl (22).

Legler's (20). To the formaldehyde solution is added an excess of standard ammonia solution. In the gravimetric method the resulting hexamethylenetetramine is evaporated to dryness and weighed. In the volumetric the excess of ammonia is titrated with standard acid. Eschweiler (21) pointed out that when litmus or phenolphthalein is the indicator the hexamethylenetetramine itself is neutral; hence six molecules of formaldehyde need four molecules of ammonia for neutralization; but with methyl-orange, cochineal, Congo-red, or tropeolin the monoacid compound of hexamethylenetetramine is neutral; hence six molecules of formaldehyde need only three of ammonia for neutralization.

The qualitative tests of Hehner (10), Lebbin (15), and Rimini (16) are generally recommended as being about the best. It is generally best to distill the substance and to apply the tests to the distillate. It must be borne in mind that the presence of a trace of formaldehyde in food substances or elsewhere may not be the result of intentional

addition, as formaldehyde exists in the air, in smoke, and elsewhere as an incidental and often unsuspected product.

For the determination of the formaldehyde in strong solutions, the method most highly recommended is that of Blank and Finkenbeiner (19). Legler's volumetric method (20) is also in frequent use.

For the determination of the formaldehyde content of weak solu tions Romijn's (18) iodometric method is the most convenient and is trustworthy if the solution is known to be pure; other aldehydes and acetone are especially not allowable. In dilute solutions containing these or unknown substances in addition to the formaldehyde it is safer to use the cyanide method (17).

The exact determination of small amounts of formaldehyde in admixture with other organic matter is always difficult and often impossible, owing to chemical changes taking place between the organic matter and the formaldehyde or between the reagents employed for the formaldehyde and the organic matter. Colorimetric methods (23, 24, 25) furnish approximate results, and in the case of milk, at least, (26) a nearly constant fraction of the formaldehyde can be distilled over if exact methods are employed.

In quantitative determinations of formaldehyde much care is needed on account of its volatility and instability. In many of the best methods, also, unanticipated reactions are apt to vitiate the results unless directions are followed exactly; hence it is recommended by Fresenius and Gruenhut that no result should be accepted without the concordance of at least two distinct methods (27).

WORK BY PREVIOUS INVESTIGATORS.

There has been an immense amount of work done by investigators upon the antiseptic and germicidal value of formalin. The following is a brief résumé of all the principal articles.

Trillat (28) showed that the following percentages of formaldehyde are necessary to prevent putrefaction of bouillon kept at 30° C.:

1:50,000 delayed putrefaction very sensibly.

1:25,000 bouillon unaltered at the end of four days.

1:12,000 remained unaltered after several weeks.

Bouillon inoculated with bacillus anthracis was rendered sterile by 1:25,000.

The putrefaction of 10 c. c. of bouillon inoculated with 10 gtts. human saliva was sensibly delayed by 1:50,000.

1:30,000 remained unaltered at the end of fourteen days.

1:1,000 killed all the organisms in less than two hours.

Gelatine contaminated with sewage water containing 1,800,000 organisms to the c. c. showed no growth after being treated with 1:20,000.

1:1,000 killed all of the organisms after some hours exposure.

Its power of preventing fermentation in milk and wine is very marked in very small proportions, 1:4,000 in wine putting an end to fermentation.

Meat immersed and quickly withdrawn from a solution of 1:500 was preserved from putrefaction for several days.

Aronson (29) found that any proportion of formaldehyde in excess of 1:20,000 prevented the growth of B. typhosus, B. anthracis, and Staphylococcus pyogenes aureus; 1:40,000 hindered the growth, but 1:80,000 seems to have no influence.

He found that the growth of B. diphtheriæ was prevented by the application for ten seconds of a solution of formaldehyde containing 1:250; also, that twenty seconds exposure to a solution of 1:400 sterilized a culture of B. diphtheriæ.

Berlioz (30) gives the quantity of formalin to 1,000 grams required to check the growth of the organisms and the quantity of formalin to 1,000 grams which did not check their growth, as follows:

	Checks growth.	Does not check growth.
Culture from—	*Gram.*	*Gram.*
Leucorrheal discharge	0.03	0.026
B. coli communis	.03	.02
B. typhosus	.05	.04
B. anthracis	.05	.04

Putrefaction of urine and bouillon is prevented by 0.06 gram to 1,000 grams.

Coagulation of milk is prevented by 0.2 gram to 1,000 grams.

Pieces of sterilized silk inoculated with cultures of B. anthracis and typhosus were immersed in a 1:1,000, 1:500, and 1:100 solution of formalin, then inoculated into bouillon. The bouillon became cloudy.

Blum (31) in his experiments added 10 c. c. of a bouillon culture to 90 c. c. of the formaldehyde solution, making 5 per cent of the 40 per cent solution [Formalin, A. M. S.] or 2 per cent formaldehyde.

B. chicken cholera.—Seven-day culture, 37° C., no effect after ten, seventeen, and twenty-five minutes; but no growth occurred when inoculations were made next day.

Proteus capsulatus.—Eight-day culture. After fifteen minutes the power to grow was much influenced, as a clouding of the inoculated bouillon occurred only after several days. After twenty-five minutes no living bacteria remained.

Staphylococcus pyogenes aureus.—Twenty-four hour culture. Growth much retarded by fifteen and twenty-five minutes exposure. Inoculations after thirty-five minutes remained sterile.

B. typhi abdominalis.—Not killed by exposure for five, ten, fifteen, twenty-five, and thirty-five minutes.

B. anthracis.—Bouillon culture three weeks old. No disinfection after ten, fifteen, and twenty-five minutes. Growth is, however, slower. Bouillon inoculation next day remained sterile. Twenty-five minutes exposure did not affect virulence to white mice.

Anthrax spores.—Silk threads impregnated with anthrax spores not killed by thirty-five minutes exposure. Killed by nine days.

Concludes that the disinfectant action is slow, but the antiseptic action more marked.

Carlo Ascoli (32) used slips of bibulous paper impregnated with cultures of various micro-organisms. The disinfecting agent was allowed to act for different periods, washed in sterile water, planted in bouillon, and placed in the incubator for ten days' observation. He found that 5 per cent formalin killed V. choleræ in three minutes, anthrax bacilli in fifteen minutes, anthrax spores in five hours, B. diphtheriæ in ten minutes, and Staphylococcus pyogenes aureus in thirty minutes.

Slater and Rideal (33) made experiments to determine the proportion of formaldehyde required to inhibit the growth of micro-organisms.

Formalin was added to tubes of bouillon, so that they contained formaldehyde in proportions varying from 1:1,000 to 1:20,000. These tubes were inoculated with various micro-organisms and placed in the incubator twenty-four hours. Vigorous cultures were used, either in bouillon or on agar.

Organism.	Proportion formaldehyde inhibiting growth.	Proportion formaldehyde allowing some growth.	Remarks.
Staphylococcus pyogenes aureus.	1:5,000	1:10,000	Growth poor, 1:10,000; delayed much, 1:20,000.
B. typhosus	1:15,000	1:20,000	Very scanty.
B. coli communis	1:7,000	1:10,000	After 72 hours' incubation.
B. anthracis	1:15,000	1:20,000	Scanty growth sixth day.
Spirillum choleræ	1:20,000	.....	
B. mallei	1:20,000	.....	
B. pyocyaneus	1:7,000	1:10,000	On third day.
B. prodigiosus	1:20,000	.....	
B. lacticus	1:20,000	.....	
B. butyneus Heuppe	1:20,000	.....	

Silk threads infected by soaking in twenty-four hour cultures; strength of formaldehyde being 1 per cent.

Organism.	Time required to kill microbes.
Staphylococcus pyogenes aureus	Between 50 and 60 minutes.
B. typhosus	Between 40 and 50 minutes.
B. coli communis	Between 30 and 40 minutes.
B. anthracis	Less than 15 minutes.
Spirillum choleræ	Do.

Silk threads infected with twenty-four hour cultures; strength of formaldehyde 1:1,000.

Organism.	Was not killed after—	Was killed in—
B. anthracis (no spores)	.....	30 minutes.
Spirillum choleræ	.....	2 hours.
Staphylococcus pyogenes aureus	12 hours	24 hours.
B. typhosus	do	Do.
B. coli communis	do	Do.
B. mallei	11 hours	12 hours.
Putrefactive organisms	24 hours	

Experiments to determine its value as a disinfectant for soiled linen—Time of exposure to disinfectant twenty to twenty-four hours.

Material.	1 per cent solution.	1:10,000 solution.
Cloths from post-mortem room	Sterile	Not sterile.
Cloths soaked in B. typhosus culture	do	Sterile.
Cloths soaked in culture of Spirillum choleræ	do	Do.
Cloths soaked in culture of Staphylococcus pyogenes aureus	do	Do.

Marcel-Arsine Mariot (34) states that proportions of formaldehyde 1:1,000 to 1:50,000 prevented putrefaction of unsterilized bouillon up to forty-eight hours, when observations ceased. The tubes were kept at 37° C.

G. Bardet (35) found that formalin in the proportion of 1:30,000 sensibly retarded the putrefaction of bouillon kept in the incubator at 30° C. and in 1:25,000 the bouillon remained unaltered at the end of four days; 1:12,000 preserved the bouillon from putrefaction for several weeks.

In sewage containing 1,800,000 organisms per c. c. all of the organisms are destroyed by formalin (proportions not stated).

Small quantities suffice to sterilize flasks containing anthrax and organisms from the saliva.

Ehrlich (36) made the following observations:

100 c. c. of milk + formaldehyde.

	0.02 c. c.	0.004 c. c.	0.002 c. c.	0.0 c. c.
Taste	Distinctly formol.	Very little formol.	Scarcely perceptible.	Good.
Smell	do	do	do	0.
Smell after 24 hours	0.	0.	0.	0.
Status after—				
24 hours	Fresh	Begins to coagulate.	Begins to coagulate.	Coagulated; sour.
48 hours	Begins to coagulate.	Coagulated; sour.	Coagulated; sour.	Lumpy and sour.

Amount of formalin in 100 c. c. of milk.

	0.4 c. c.	0.2 c. c.	0.12 c. c.	0.08 c. c.	0.04 c. c.	0.0 c. c.
Taste	Bad, strong itching in throat.	Bad, strong itching in throat.	Bad itching in throat.	Bad itching in throat.	Bad itching in throat.	Good.
Smell	Strong formol.	Strong formol.	Strong formol.	Formaldehyde.	Formol	0.
Smell, after 24 hours.	Weak formol.	Weak formol.	0	0	0	0.
Status after—						
24 hours	Not coagulated.	Not coagulated.	Not coagulated.	Not coagulated.	Not coagulated.	Begins to coagulate.
48 hours	do	do	do	do	do	Coagulated and sour.
96 hours	do	do	do	do	do	Lumpy and sour.
120 hours	do	do	do	do	do	Do.
144 hours	do	do	do	do	Begins to coagulate.	Do.
168 hours	do	do	do	Begins to coagulate.	Coagulated.	Ill smelling, sour, and lumpy.
192 hours	Begins to coagulate.	Begins to coagulate.	Begins to coagulate.	Coagulated.	Coagulated and sour.	Do.

Amount of formalin in 100 c. c. of milk—Continued.

	0.02 c. c.	0.004 c. c.	0.002 c. c.	0.0 c. c.
Taste	Distinctly formaldehyde.	Less distinct formaldehyde.	Scarcely perceptible.	Good.
Smell	....do	....do	....do	0.
Smell after 24 hours.	0	0	0	0.
Status after—				
24 hours	Fresh	Fresh	Fresh	Fresh.
72 hours	....do	Begins to coagulate.	Sour and coagulated.	Sour and lumpy
96 hours	....do	Coagulated and sour.	....do	Do.
120 hours	Begins to coagulate.	....do	....do	Do.
144 hours	Coagulated and sour.	Lumpy and sour	Lumpy and sour	Do.
168 hours	....do	....do	....do	Sour, lumpy, foul smelling.

Sibilia (37) experimented with different percentages of formalin upon anthrax spores. His results are indicated in the table here given.

Anthrax spores in suspension used to contaminate silk threads; temperature, 37° C.

Minutes exposure.	1 per cent.			2 per cent.			5 per cent.			10 per cent.		
	Hours.			Hours.			Hours.			Hours.		
	3.	5.	20.	3.	5.	20.	3.	5.	20.	3.	5.	20.
1	+	+	.....	+	+	.....	+	+	.....	+	+	+
2	+	+	.....	+	+	.....	+	+	.....	+	+	+
5	+	+	.....	+	+	.....	+	+	+	−	+	−
10	+	+	+	+	+	+	−	+	+	−	−	−
20	+	+	+	+	+	−	−	−	+	−	−	−
30	+	+	+	−	−	−	−	−	+	−	−	−
40	−	+	−	−	−	−	−	−	+	−	−	−
50	−	−	−	−	−	−	−	−	+	−	−	−
60	−	−	−	−	−	−	−	−	+	−	−	−

Vanderlinden and De Buck (38) obtained the following:

Showing the results of 5 per cent formalin acting upon organisms for various periods of time.

Organism.	Minutes action of formalin.	Result.
Anthrax spores	35	Growth.
B. coli communis	15	Killed.
B. diphtheriæ	15	Do.
B. typhosus	30	Do.
Staphylococcus pyogenes aureus	35	Do.
Streptococcus	35	Growth.

Showing the results of 10 per cent formalin acting upon organisms for various periods of time.

Organism.	Minutes action of formalin.	Result.
B. coli communis	30	Growth.
Typhoid	5	Killed.
Streptococcus	30	Growth.
Staphylococcus pyogenes aureus	30	Do.

Showing the results of 10 per cent formalin acting upon pus for various periods of time, kept at room temperature.

Pus from—	Minutes action of formalin.	Result.
Phlegmon	30	Killed.
Anthrax pustule	30	Do.
Osteomyelitis, on sound	15	Do.
Osteomyelitis, on sponge	5	Do.

Showing results of 5 per cent formalin acting upon pus, kept at room temperature.

Pus from—	Minutes action of formalin.	Result.
Infected compound fracture, on sound and sponge	30	Growth.

Showing results of 5 per cent formalin acting upon pus for various periods of time, kept at temperatures of 35 to 38° C.

Pus from—	Minutes action of formalin.	Result.
Osteomyelitis, sound	30	Killed.
Osteomyelitis, sponge	15	Do.

Showing results of 10 per cent formalin acting upon pus for various periods of time, kept at temperatures of 35 to 38° C.

Pus from—	Minutes action of formalin.	Result.
Phlegmon, sound	5	Killed.
Phlegmon, sponge	15	Do.

Rideal (39) states that 1 part of formaldehyde to 10,000 of milk the milk remained fresh without curdling for seven days.

Milk and water 10,000 parts and milk and water 100,000 parts, with 1 part of formalin, remained sweet and fresh for twelve and four days, respectively. Control soured on the third day.

One part of formaldehyde to 46.08 parts of milk, or 1 c. c. formaldehyde to 18.432 c. c. milk, keeps it fresh at least three days.

The strength of formalin used by the trade to preserve milk was found to be 1:320.

Strehl (40) used Schering's formalin. Action of spray on carpets. Various kinds of carpets treated by rubbing in virulent cultures (bouillon) of staphylococcus and anthrax, then dried and hung up. Various strengths of formalin solution then sprayed on the surface so as to moisten it evenly. After twenty-four hours pieces were placed in bouillon. Five per cent formalin did not kill staphylococci, but 10 per cent killed all bacteria.

In his original work, Walter (41) calls attention to the misunderstanding arising from the improper use of the terms formaldehyde and formalin. Aronson, Trillat, and most investigators used formaldehyde solutions; Oehmichen used formalin. The author also uses as a basis formalin (40 per cent formaldehyde solution).

Treated nutrient gelatin with different amounts of formalin, inoculated with broth cultures, made Esmarch roll tubes, and observed after a week:

Concentration.	Anthrax spores.	Cholera.	Typhoid.	Staphylococcus pyogenes aureus.	Diphtheria.
1:10,000 and greater	−	−	−	−	−
1:20,000	+	+	+	+	+
1:50,000 and 1:100,000	++	++	++	++	++
Control	++	++	++	++	++

− = no growth. + = small growth. ++ = rich growth.

To test the bactericidal power he made up formalin solutions of various strengths in flasks, added to each agar cultures of germs, shook well, and added the mixtures to fluid gelatin from which roll tubes were made after certain exposures. He says that the antiseptic action of what formalin remained after dilution in gelatin was negligible.

SUMMARY OF RESULTS.

Staphylococcus pyogenes aureus.

1:2,000, growth after 2 hours' exposure, liquefaction after 1¾ hours to half a minute.

1:1,000, growth after 2 hours, liquefaction after 1 hour and less.

1:100, no growth after 45 minutes, growth after 30 minutes, liquefaction after 10 minutes.

3:100, no growth after 2 minutes, growth after 1 minute.

Streptococcus pyogenes.

1:2,000, no growth after 1¼ hours, growth after 1 hour and less.

1:1,000, no growth after 20 minutes, growth after 15 minutes.

1:100, no growth after 1 minute, growth after ½ minute.

Anthrax spores (dried on silk threads).

1:2,000, growth after 2 hours, liquefaction after 1 hour and less.

1:1,000, growth after 2 hours, liquefaction after 2 minutes and less.

1:100, no growth after 30 minutes, growth after 20 minutes, liquefaction after 5 minutes and less.

3:100, no growth after 15 minutes, growth after 10 minutes, liquefaction after 5 minutes and less.

B. typhosus.

1:1,000, no growth after 1¾ hours, growth after 1½ hours and less.

1:100, no growth after 20 minutes, growth after 15 minutes and less.

3:100, no growth after 1 minute, growth after ½ minute.

Cholera.

1:1,000, no growth after 1 hour, growth in 45 minutes, liquefaction in 2 minutes and less.

1:100, no growth after 5 minutes, growtn after 2 minutes, liquefaction after ½ minute.

3:100, no growth after ½ minute.

Diphtheria.

1:1,000, no growth after 1½ hours, growth after 1 hour and less.

1:100, no growth after 15 minutes, growth after 10 minutes and less.

3:100, no growth after ½ minute.

Putrefying blood (50 c. c. + 49 c. c. aq. dist. + 1 c. c. formalin).

1:100, no growth after 1¼ hours, growth after 1 hour, liquefaction after 5 minutes.

Formalin did not work well in disinfecting instruments. Three per cent was efficient in disinfecting those artificially infected.

To determine the action of formalin on larger articles pieces of cloth, a uniform collar, etc., were soaked in cultures of staphylococcus pyogenes aureus, dried, and sprayed with formalin solutions of various strengths. One part was wrapped rather tightly in a towel and the other placed under an air-tight bell jar. After six hours the articles were sterile. The amounts used were 3, 5, 10, and 100 per cent, the results being the same.

In the next experiment large cloths of linen were soaked in staphylococcus bouillon cultures. One was strewn with formalin powder which contained 20 per cent formalin and tied up fairly tight in water-tight tissue. After twenty-four hours some colonies grew on gelatin, but after forty-eight and seventy-two hours none grew; molds grew on all three.

A series of experiments showed that while neither formalin 3 per cent or absolute alcohol alone killed anthrax spores dried on silk threads, a mixture of alcohol and formalin 3 per cent killed them on threads moistened in sterile water after 8 minutes' exposure.

Also, as regards staphylococcus pyogenes aureus—

Absolute alcohol, growth after 3 minutes, none after 4 minutes.

50 per cent alcohol, growth after 10 minutes and less.

3 per cent formalin, no growth in 1 minute.

3 per cent formalin in absolute alcohol, no growth in 1 minute.

3 per cent formalin in 50 per cent alcohol, no growth in 1 minute.

2 per cent formalin in 50 per cent alcohol, no growth in 1 minute.

1 per cent formalin in 50 per cent alcohol, no growth in 4 minutes, growth after 3 minutes.

1 per cent formalin, growth after 10 minutes.

Walter got the following results with artificially infected stools (cholera and B. coli):

1 per cent, cholera killed in 5 minutes. B. coli lived after 60 minutes and less.

3 per cent, cholera killed. B. coli killed after 30 minutes, lived after 10 minutes.

5 per cent, cholera killed. B. coli killed after 30 minutes, lived after 10 minutes.

10 per cent, cholera killed. B. coli killed after 10 minutes, lived after 5 minutes.

His conclusions concerning liquid formalin were as follows:

Concentrations of 1:10,000 make further growth of anthrax, cholera, typhoid, staphylococcus pyogenes aureus, and diphtheria impossible.

One per cent solutions kill pathogenic germ cultures in one hour. In dilute alcoholic solutions the action is more intense.

Three per cent solutions render the hands sterile.

Articles may be disinfected by spraying with formalin solutions and inclosing air-tight.

Feces are rendered germ free in ten minutes by 10 per cent solutions.

Hammer and Feitler (42) noted that formaldehyde in gas form or solution is more active against anthrax and its spores than against various other bacteria. This has given rise to the idea that its bactericidal efficiency was greater than it really was, because anthrax and its spores were assumed to be very resistant, and their destruction led to the assumption that other bacteria would be similarly influenced. Attention is not called to this in the literature. Only Gruber notes how easily anthrax is killed. He says that anthrax spores placed in cattle cars and exposed twenty-four hours to the vapor developed by spraying the inner walls with 10 to 20 per cent solution of formalin were killed.

Bouillon cultures were exposed to various strengths of solution for various times and then carried over to agar (diphtheria to blood serum) and growth observed one week.

Spore-free anthrax was always killed by 1 per cent formalin after five minutes, while cholera, diphtheria, green pus, staphylococcus, and typhoid were only killed after one hour.

Anthrax spores were killed by 1 per cent in two hours, by 0.4 per cent in one hour, and 0.5 per cent in ten minutes.

Spores of other bacteria were killed as follows:

Mycoides, 0.5 per cent, only after one hour.

Subtilis, 0.5 per cent, only after twenty-four hours.

Potato bacteria, 0.5 per cent, only after twenty-four hours.

Burring (43), to determine the germicidal properties of formaldehyde, made tests with spores of *B. anthracis* and *Staphylococcus pyogenes aureus*. Bouillon tubes with formaldehyde in the following proportions were prepared 1:3,000, 1:2,000, 1:800, 1:500, 1:300, and 1:200 and inoculated with virulent cultures of above-named organisms, but showed no growth in any case.

Thresh and Lowden (44) observed no sterilizing effect whatever with spray which did not thoroughly wet the surface with the disinfectants used.

Young, active cultures in bouillon of diphtheria, typhoid, pyocyaneus bacilli, and micrococcus prodigiosus were distributed by means of pipettes on surfaces, as wood, whitewash, wall paper; controls always

made. The surfaces of wood and whitewash were scraped deeply in making cultivations. Excluding the experiments which failed by reason of the presence of *B. subtilis*, 5 per cent solution of formalin killed all organisms on wood and wall paper, and failed only with *B. pyocyaneus* on whitewash. With 1 per cent the only failure was with *Streptococcus pyogenes albus* on whitewash; with 2 per cent every surface was absolutely sterilized.

The results of the experiments are:

1. That for spraying to be efficient every portion of the surface infected must be thoroughly moistened with the disinfectant.

2. That whitewashed surfaces require particular attention, being by far more difficult to disinfect than wood or paper. Solutions containing under 2 per cent formalin are not reliable.

Kokubo (45) compared lysol or septoform and formalin soap containing 10 per cent and 25 per cent formalin with carbolic acid. He concluded that both formalin preparations were much more destructive toward anthrax than carbolic acid, for the spores lived in a 3 per cent carbolic acid solution for twenty-five days, while a 50 per cent solution of formalin soap killed in twenty-five minutes; but upon typhoid, streptococcus, and staphylococcus the carbolic acid solution was slightly more active.

Price (46) made a study of the influence of preservatives upon digestive enzymes, undertaken with the object of determining the minimum amount of formaldehyde, boric acid, borax, and salicylic acid required to preserve milk for forty-eight hours, the effect of the several preservatives upon the digestibility of the milk being subsequently determined by feeding the treated milk to calves.

A number of experiments were also carried on to determine the minimum amount of formaldehyde that could be added to milk without affecting the action of certain enzymes in vitro, and, in addition, the effect of formaldehyde upon some of the more common bacteria was studied.

His conclusions were:

1. Formaldehyde added to milk, 1:20,000, preserves it for forty hours.

2. Formaldehyde added to milk, 1:10,000, does not interfere with the digestibility when fed to calves.

3. Milk preserved with formaldehyde fed to calves for long periods; calves remained healthy and gained in weight.

4. Formaldehyde added to milk, 1:2,500 or less, has no effect on the activity of the fresh enzymes, rennet, pepsin, pancreatin, and steapsin in vitro.

5. Formaldehyde plus starch, 1:2,500 or less, has no effect on the conversion of starch by ptyalin and amylopsin in vitro.

6. Formaldehyde with milk, 1:20,000, has no effect on the activity of the enzyme galactose in vitro.

7. Formaldehyde and milk, 1:2,000, prevents the development of the common bacteria; 1:1,560 kills them in twenty-four hours.

Southard (47) found that 1:1,000,000 solution of formalin will prevent development of bacteria, while 1:75,000 is germicidal. A 5 per cent solution gives better results than 2.5 per cent carbolic acid or 1:500 solution of corrosive sublimate.

Levy (48) gives a critical review of literature and methods. He gives 269 references to literature. Following is a tabulated statement of the results of various investigators:

Growth inhibited in formaldehyde dilutions.

Author.	Staphylococcus pyogenes aureus.	B. typhosus.	B. anthracis.	B. coli communis.	B. choleræ.	Observations.
Slater and Rideal	1:5,000	1:15,000	1:15,000	1:7,000	1:20,000	
Loëw and Walter	1:10,000	1:10,000	1:10,000	.....	1:10,000	
Aronson	1:20,000	1:20,000	1:20,000	.....	.....	Weakened growth at 1:14,000.
Trillat and Berlioz	.....	1:20,000	1:25,000	1:33,000	.....	No certain action at 1:8,000.
Schmitt	1:20,000	1:20,000	.....	.....	.....	Minimal growth.
Leroy des Barres	.....	.....	1:10,000	.....	.....	
Schild	.....	1:13,000	.....	.....	.....	
Abel	.....	1:7,000	.....	.....	.....	
F. Blum	.....	.....	.....	.....	.....	1:3,000.
Pottevin	.....	.....	.....	.....	.....	1:6,250 to 1:14,300 according to number of germs.
Rosenberg	.....	.....	.....	.....	.....	1:10,000 "Holzin."

The germs are killed as follows:

Observer.	Organism.	Time.	Solution.	Result.
Slater and Rideal	Staphylococcus	55 minutes.	1 per cent formaldehyde.	Dried on silk thread.
	Typhoid	45 minutes.	do	Do.
	Anthrax	15 minutes.	do	Do.
	Colon	35 minutes.	do	Do.
	Cholera	15 minutes.	do	Do.
	Staphylococcus	24 hours	1 per thousand	Do.
	Typhoid	do	do	Do.
	Anthrax	30 hours	do	Do.
	Colon	24 hours	do	Do.
	Cholera	2 hours	do	Do.
Aronson	Diphtheria	10 seconds.	$\frac{1}{250}$ to $\frac{1}{100}$	Dried on wood.
	Typhosus	15 minutes.	$\frac{1}{750}$	Do.
Œmichen	Tubercle	do	1 per cent	
Wernicke	Anthrax in blood.	24 hours	$\frac{1}{2}$ per cent	Do.
Rosenberg	Anthrax		$\frac{1}{10000}$	Using "sterisol" lactose with 3 per cent formaldehyde.
Stahl	do	$\frac{1}{4}$ hour	$\frac{1}{1000}$	
	Staphylococcus		$\frac{1}{750}$	
Berlioz	B. coli		$\frac{1}{1000}$	
Schmitt	do		$\frac{1}{2000}$	
	Staphylococcus		$\frac{1}{20000}$	
Ascoli	Cholera	3 minutes	5 per cent	
	Diphtheria	10 minutes.	do	
	Anthrax	15 minutes.	do	
	Staphylococcus	30 minutes.	do	
Kraus			$\frac{1}{500}$–$\frac{1}{2000}$	Necessary proportion for killing.
Van der Linden and Buck.	Diphtheria	15–30 minutes.	5 per cent	
	Typhosus	do	do	
	Staphylococcus	do	do	
	Streptococcus	30 minutes.	do	
	B. coli	do	do	
Blum	Typhosus	5 minutes.	do	
	Staphylococcus	35 minutes.	do	
	Anthrax	24 hours		
Walter	Nearly all pathogenic organisms.	30 minutes.	$\frac{1}{1000}$	
	Anthrax spores	$\frac{1}{4}$ hour	1 per cent	
	do	15 minutes.	3 per cent	
Œmichen	do	2½ hours	do	
	do	1 hour	2 per cent	
Ascoli	do	5 hours	5 per cent	
Pottevin	do	1¼ hours	15 per cent	At 15°.
	do	5 minutes.	do	At 52°.
	do	15 minutes.	2 per cent	Do.

ORIGINAL WORK.

ANTISEPTIC POWER OF FORMALIN.

A series of experiments was made to determine the amount of formalin necessary to restrain the development of bacteria and molds in stable manure, garden earth, etc. For this purpose nutrient broth was placed in sterile flasks and formalin added in proportion of 1 to 7,000 down to 1 to 500. The broth was then inoculated with the various materials, kept at room temperature, and observed for fourteen days.

TABLE No. 1.—*Nutrient bouillon containing various precentages of formalin contaminated by the addition of garden earth; kept at room temperature (37.2 per cent formic aldehyde).*

Dilution.	Growth appeared on—			
	Second day.	Third day.	Fourth day.	Seventh day.
1 to 7,000	Cloudy; mold on bottom.			
1 to 6,000	....do			
1 to 5,000	....do			
1 to 4,000	Mold on bottom	Mold		
1 to 3,000	....do			
1 to 2,000	....do			
1 to 1,000				Mold on bottom.
1 to 500				

TABLE No. 2.—*Nutrient bouillon containing various percentages of formalin contaminated by the addition of stable manure; kept at room temperature (37.2 per cent formic aldehyde).*

Dilution.	Growth appeared on—			
	Second day.	Third day.	Fourth day.	Seventh day.
1 to 7,000	Cloudy	Mold on bottom		
1 to 6,000	....do	....do		
1 to 5,000	....do	....do		
1 to 4,000		Cloudy; mold on bottom.		
1 to 3,000		Mold on bottom		
1 to 2,000			Mold on bottom	
1 to 1,000				Mold on bottom.
1 to 500				

TABLE No. 3.—*Nutrient bouillon containing various percentages of formalin contaminated by the addition of bits of hay; kept at room temperature (37.2 per cent formic aldeyde).*

Dilution.	Growth appeared on—			
	Second day.	Third day.	Fourth day.	Seventh day.
1 to 7,000	Cloudy; surface mold.			
1 to 6,000	....do			
1 to 5,000	....do			
1 to 4,000	Surface mold	Cloudy		
1 to 3,000		Mold on bottom		
1 to 2,000		Surface mold		
1 to 1,000			Mold on bottom	
1 to 500				

It will be seen from Table No. 1 that in the flask to which garden earth was added bacterial growth ceased in the dilution of 1 to 5,000 and molds developed on the seventh day in the dilution of 1 to 1,000.

In the flask to which stable manure was added bacterial growth occurred in the dilution of 1 to 4,000 and molds on the seventh day in 1 to 1,000.

In the flask to which were added bits of hay bacterial growths occurred in a dilution of 1 to 4,000 and molds on the fourth day in a dilution of 1 to 1,000.

It will be seen that the lowest dilution in which bacterial growth occurred was 1 to 4,000 and molds in 1 to 1,000.

ANTISEPTIC POWER AGAINST PURE CULTURES.

The above experiment having been made to determine its restraining influence for putrefactive changes, another series was made to determine its antiseptic action against pure cultures of bacteria.

For this purpose bouillon containing various proportions of formalin was distributed in sterile test tubes, and each tube was then inoculated with a small loopful of a forty-eight-hour agar culture of the particular organism, placed in the incubator at 37° C., and observed daily for fifteen days. The formalin used contained 37.2 per cent formic aldehyde.

TABLE No. 4.—*Bouillon containing various percentages of formalin was distributed in test tubes, and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of Bacillus typhosus, kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; − no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000..	−	−	−	+ scant.	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000..	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+
1 to 5,000..	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+
1 to 4,000..	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+
1 to 3,000..	−	−	−		−	−	−	−	−	−	−	−	−	−	−
1 to 2,000..	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000..	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500....	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 5.—*Bouillon containing various percentages of formalin was distributed in test tubes, and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of Staphylococcus pyogenes citreus, kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; − no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	−	−	−	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+	+
1 to 5,000...	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+	+
1 to 4,000...	−	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+
1 to 3,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 2,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 6.—*Bouillon containing various percentages of formalin was distributed in test tubes, and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of Staphylococcus pyogenes albus, kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; − no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	+	+	+	+	+++	+++	+	+	+	+	+++	+++	+	++	+++
1 to 6,000...	−	+	+	+	+++	+++	+	+	+	+	+++	+++	+	++	+++
1 to 5,000...	−	−	+	+	+++	+++	+	+	+	+	+++	+++	+	++	+++
1 to 4,000...	−	−	−	+ scant.	+	+	+	+	+	+	+	+	+	+	+
1 to 3,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 2,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 7.—*Bouillon containing various percentages of formalin was distributed in test tubes, and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of Staphylococcus epidermidis albus, kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth: − no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	−	−	−	+	+	−	+	+	+	+	+	+	+	+	+
1 to 6,000...	−	−	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+
1 to 5,000...	−	−	−	−	−	−	−	−	−	+ scant.	+	+	+	+	+
1 to 4,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 3,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 2,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 8.—*Bouillon containing various percentages of formalin was distributed in test tubes, and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of Staphylococcus pyogenes aureus, kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; − no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 5,000...	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 4,000...	−	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+	+
1 to 3,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 2,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 9.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. prodigiosis kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; − no growth.

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	−	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+	+	+
1 to 5,000...	−	−	−	−	+ scant.	+	+	+	+	+	+	+	+	+	+
1 to 4,000...	−	−	−	−	−	−	−	−	+ scant.	+	+	+	+	+	+
1 to 3,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 2,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 10.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. acidi lactici kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; − no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	−	−	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 5,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 4,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 3,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 2,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 1,000...	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−
1 to 500	−	−	−	−	−	−	−	−	−	−	−	−	−	−	−

TABLE No. 11.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. subtilis kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000	–	–	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000	–	–	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 5,000	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+	+	+
1 to 4,000	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+
1 to 3,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 12.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. megaterium kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000			–	–	+ scant.	+	+	+	+	+	+	+	+	+	+
1 to 6,000			–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 5,000			–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 4,000			–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 3,000			–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000			–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000			–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–		–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 13.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. pestis kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000	–	–	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+
1 to 5,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 4,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 3,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 14.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. mallei kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth: – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+
1 to 6,000...	–	–	–	–	–	–	–	–			–	–	–	–	–
1 to 5,000...	–	–	–	–	–	–	–	–			–	–	–	–	–
1 to 4,000...	–	–	–	–	–	–	–	–			–	–	–	–	–
1 to 3,000...	–	–	–	–	–	–	–	–			–	–	–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–			–	–	–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–			–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–			–	–	–	–	–

TABLE No. 15.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. anthracis kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth: – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	–	–	–	+ scant.	+	+	+	+	+	+	–	+	+	+
1 to 6,000...	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+	+
1 to 5,000...	–	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+
1 to 4,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 3,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 16.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. diphtheriæ kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth: – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	–	–	+	+	+	+	+	+	+	+	–	+	+	+
1 to 6,000...	–	–	–	+	+	+	+	+	+	+	+	–	+	+	+
1 to 5,000...	–	–	–	+	+	+	+	+	+	+	+	–	+	+	+
1 to 4,000...	–	–	–	–	–	–	–	–	–	–	–		–	–	–
1 to 3,000...	–	–	–	–	–	–	–	–	–	–	–		–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–	–	–	–		–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–	–	–	–		–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–		–	–	–

TABLE No. 17.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of Cholera kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+
1 to 6,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 5,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 4,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 3,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 18.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. pyocyaneus kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...		+	+	+	++	++	++	++	++	++	++	++	++	++	++
1 to 6,000...		+	+	++	++	++	++	++	++	++	++	++	++	++	++
1 to 5,000...		+	+	++	++	++	++	++	++	++	++	++	++	++	++
1 to 4,000...		+ scant.	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 3,000...		–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000...		–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000...		–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 19.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. dysenteriæ Shiga kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000 ..	–	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000 ..	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+
1 to 5,000 ..	–	–	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+
1 to 4,000 ..	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 3,000 ..	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000 ..	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000 ..	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 20.—*Bouillon containing various percentages of formalin was distributed in test tubes, and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. coli communis kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	+	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+	+	+
1 to 5,000...	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+	+	+
1 to 4,000...	–	–	–	–	–	–	–	–	–	+ scant.	+	+	+	+	+
1 to 3,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 21.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. proteus kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 5,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 4,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 3,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 22.—*Bouillon containing various percentages of formalin was distributed in test tubes and each tube was inoculated with a small loopful of a forty-eight-hour agar culture of B. enteritidis kept under observation in the incubator at 37° C. for fifteen days.*

[+ means growth; – no growth.]

Dilution.	First day.	Second day.	Third day.	Fourth day.	Fifth day.	Sixth day.	Seventh day.	Eighth day.	Ninth day.	Tenth day.	Eleventh day.	Twelfth day.	Thirteenth day.	Fourteenth day.	Fifteenth day.
1 to 7,000...	–	–	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 6,000...	–	–	+	+	+	+	+	+	+	+	+	+	+	+	+
1 to 5,000...	–	–	+ scant.	+	+	+	+	+	+	+	+	+	+	+	+
1 to 4,000...	–	–	–	–	–	–	+ scant.	+	+	+	+	+	+	+	+
1 to 3,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 2,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 1,000...	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–
1 to 500	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–

TABLE No. 23.—*Summary showing lowest dilution in which all growth was restrained.*

Organism.	Dilution in which all growth was restrained.
Staphylococcus epidermidis albus	1 to 4,000
Staphylococcus pyogenes albus	1 to 3,000
Staphylococcus pyogenes aureus	1 to 3,000
Staphylococcus pyogenes citreus	1 to 3,000
Bacillus typhosus	1 to 3,000
Bacillus coli communis	1 to 3,000
Bacillus dysenteriæ (Shiga)	1 to 4,000
Bacillus pyocyaneus	1 to 3,000
Bacillus choleræ	1 to 6,000
Bacillus diphtheriæ	1 to 5,000
Bacillus mallei	1 to 6,000
Bacillus anthracis	1 to 4,000
Bacillus pestis	1 to 5,000
Bacillus megaterium	1 to 6,000
Bacillus subtilis	1 to 3,000
Bacillus prodigiosis	1 to 3,000
Bacillus acidi lactici	1 to 6,000
Bacillus proteus	1 to 6,000
Bacillus enteritidis	1 to 3,000

From the above it will be seen that many of the organisms used grew in dilutions as low as 1 to 4,000; a few were restrained in a dilution of 1 to 6,000; none grew in a stronger solution than 1 to 3,000.

GERMICIDAL POWER OF FORMALIN.

The germicidal power of formalin in various strengths was studied on pure cultures, human feces, and sputum. The growth in broth tubes was principally used. Agar plates were also made at corresponding intervals in order to determine when the maximum effect of formalin is exerted.

GERMICIDAL POWER AGAINST PURE CULTURE.

The germicidal power of formalin was determined in 1, 2, 3, 5, and 10 per cent dilutions against the principal pathogenic organisms. The following method was observed in each case: For a 5 per cent strength 94 c. c. of sterile water was placed in a sterile flask and 1 c. c. of a heavy emulsion, freed from clumps, of a forty-eight-hour slant agar culture of the organism being studied was added; then 5 c. c. of formalin was added to the entire contents of the flask and well shaken. One loopful at ten-minute intervals up to one hour was planted in a full tube of nutrient bouillon and the growth noted from day to day.

The experiments were repeated in each dilution so as to check any irregularities that might occur.

TABLE No. 24.—*One per cent formalin (37.2 per cent aldehyde).*

Organism	Time of exposure to formalin.								Control grew in—
	Minutes.					Hours.			
	10.	20.	30.	40.	50.	1.	1½.	2.	
Vibrio cholera	–	–	–	–	–	–	–	–	24 hours.
B. coli communis	+	+	+	+	+	+	+	–	Do.
B. diphtheriæ	+	–	–	–	–	–	–	–	Do.
B. mallei	–	–	–	–	–	–	–	–	Do.
B. pyocyaneus	+	+	+	+	–	–	–	–	Do.
B. dysenteriæ (Shiga)	+	+	+	+	+	+	+	+	Do.
Staphylococcus pyogenes albus	+	+	+	+	+	+	+	+	Do.
Staphylococcus pyogenes aureus	+	+	+	+	+	+	–	–	Do.
B. typhosus	+	+	+	+	+	+	–	–	Do.

From the above table it will be seen that the vibrio of cholera failed to grow after ten minutes' exposure; *B. coli* grew up to ninety minutes; *B. diphtheriæ* was killed in twenty minutes; *B. mallei* was killed in ten minutes; *B. pyocyaneus* grew up to forty minutes; *B. dysenteriæ* (Shiga) and *Staphylococcus albus* grew up to two hours; *Staphylococcus pyogenes aureus* and *B. typhosus* grew up to sixty minutes.

TABLE No. 25.—*Two per cent formalin (37.2 per cent aldehyde).*

Organism.	Time of exposure to formalin.								Control grew in—
	Minutes.					Hours.			
	10.	20.	30.	40.	50.	1.	1½.	2.	
Vibrio cholera	−	−	−	−	−	−	−	−	24 hours.
B. coli communis	+	+	+	+	+	+s.	−	−	Do.
B. diphtheriæ	+	−	−	−	−	−	−	−	Do.
B. mellei	−	−	−	−	−	−	−	−	Do.
B. pyocyaneus	+	−	−	−	−	−	−	−	Do.
B. dysenteriæ (Shiga)	+	+	+	+	+	+s.	−	−	Do.
Staphylococcus pyogenes albus	+	+	+	+	+	+	−	−	Do.
Staphylococcus pyogenes aureus	+	+	+	+	−	−	−	−	Do.
B. typhosus	+	+	+	+	−	−	−	−	Do.

This table shows that none of the bacteria tested resisted an exposure of longer than sixty minutes to a 2 per cent solution of formalin. The fact that the colon, dysentery, and typhoid bacillus and the cocci were more resistant is shown in this table.

TABLE No. 26.—*Three per cent formalin (37.2 per cent aldehyde).*

Organism.	Time of exposure to formalin.								Control grew in—
	Minutes.					Hours.			
	10.	20.	30.	40.	50.	1.	1½.	2.	
Vibrio cholera	−	−	−	−	−	−	−	−	24 hours.
B. coli communis	+	+	+	−	−	−	−	−	Do.
B. diphtheriæ	+	−	−	−	−	−	−	−	Do.
B. mallei	−	−	−	−	−	−	−	−	Do.
B. pyocyaneus	−	−	−	−	−	−	−	−	Do.
B. dysenteriæ (Shiga)	+	+	+	+	−	−	−	−	Do.
Staphylococcus pyogenes albus	+	+	+	−	−	−	−	−	Do.
Staphylococcus pyogenes aureus	+	+	−	−	−	−	−	−	Do.
B. typhosus	+	+	−	−	−	−	−	−	Do.

Only one of the organisms, *B. dysenteriæ*, tested resisted an exposure to 3 per cent formalin forty minutes; this organism, *B. coli*, and *Staphylococcus albus* again show to be more resistant than the others tested.

TABLE No. 27.—*Five per cent formalin (37.2 per cent aldehyde).*

Organism.	Time of exposure to formalin.								Control grew in—
	Minutes.					Hours.			
	10.	20.	30.	40.	50.	1.	1½.	2.	
Vibrio cholera	−	−	−	−	−	−	−	−	24 hours.
B. coli communis	+	+	+d	−	−	−	−	−	Do.
B. diphtheriæ	−	−	−	−	−	−	−	−	Do.
B. mallei	−	−	−	−	−	−	−	−	Do.
B. pyocyaneus	−	−	−	−	−	−	−	−	Do.
B. dysenteriæ (Shiga)	+	−	+	+d	−	−	−	−	Do.
Staphylococcus pyogenes albus	+	+	+d	−	−	−	−	−	Do.
Staphylococcus pyogenes aureus	+	+d	−	−	−	−	−	−	Do.
B. typhosus	+	+d	−	−	−	−	−	−	Do.

This table shows practically the same results as with 3 per cent formalin. It would seem that there are a few of the organisms that

are more resistant than the great mass of them which are killed off by the 3 per cent solution, but these finally succumb to a 5 per cent solution.

TABLE No. 28.—*Ten per cent formalin (37.2 per cent aldehyde).*

Organism.	Time of exposure to formalin.								Control grew in—
	Minutes.					Hours.			
	10.	20.	30.	40.	50.	1.	1½.	2.	
Vibrio cholera									24 hours.
B. coli communis	−	−	−	−	−	−	−	−	
B. diphtheriæ									
B. mallei									
B. pyocyaneus									
B. dysenteriæ (Shiga)	+	−	−	−	−	−	−	−	Do.
Staphylococcus pyogenes albus	+	−	−	−	−	−	−	−	Do.
Staphylococcus pyogenes aureus	−	−	−	−	−	−	−	−	Do.
B. typhosus	−	−	−	−	−	−	−	−	Do.

Only those organisms which resisted the 5 per cent solution for ten minutes were used. Of the nonspore-bearing organisms only *B. dysenteriæ* and *Staphylococcus albus* survived an exposure of ten minutes to a 10 per cent solution of formalin.

TIME OF MAXIMUM GERMICIDAL EFFECT.

In order to study when the greatest germicidal action is exerted, pure cultures of the five most resistant organisms were exposed to a 2 per cent and a 3 per cent solution of formalin. The dilutions were made just as in the preceding experiments, but instead of making plants in broth a loopful of the exposed culture was put into a full tube of melted agar, and then poured into a petri dish which, as soon as the agar had hardened, was placed in the incubator.

The colonies were counted on the fourth day. Plants were made at five-minute intervals, except in the case of *B. pyocyaneus*, when exposed to 3 per cent formalin, and then plants were made at two-minute intervals.

TABLE No. 29.—*Two per cent formalin (37 per cent aldehyde, 1.8 acidity).*

Organism.	Number of colonies grown at different intervals of exposure.								
	At once.	5 minutes.	10 minutes.	15 minutes.	20 minutes.	30 minutes.	40 minutes.	50 minutes.	60 minutes.
B. dysenteriæ	Innumerable.	410	22	19	5	3	1	1	1
B. pyocyaneus	do	290	1	0	0	0	.....	.....	.....
B. typhosus	do	6,859	213	8	1	1	0	0	0
Staphylococcus pyogenes albus.	do	Not countable.	7,200	4,800	2,600	800	480	63	2
Staphylococcus pyogenes aureus.	do	1,080	410	94	32	9	2	0	.....

The above results show very plainly that in a 2 per cent solution the maximum effect is executed in the first five minutes, *B. dysenteriæ* and the cocci showing the greatest resistance.

TABLE No. 30.—*Three per cent formalin (37 per cent aldehyde, 1.8 acidity).*

Organism.	Number of colonies grown at different intervals of exposure.								
	At once.	5 minutes.	10 minutes.	15 minutes.	20 minutes.	30 minutes.	40 minutes.	50 minutes.	60 minutes.
B. dysenteriæ	Innumerable.	360	37	16	6	2	2	0	.....
B. typhosus	.....do.....	2,580	8	3	1	0	0	.....	.....
Staphylococcus pyogenes albus.	.....do.....	Almost innumerable.	4,320	2,820	1,800	93	0	.....	.....
Staphylococcus pyogenes aureus.	.....do.....	2,160	310	83	21	6	0	.....	.....
		2 minutes.	4 minutes.	6 minutes.	8 minutes.	10 minutes.	15 minutes.		
B. pyocyaneus	.....do.....	300	29	7	0	0	0	.....	.....

This table is especially interesting as showing that in its effect in a 3 per cent solution upon *B. pyocyaneus* the great mass of organisms are killed in the *first two minutes.*

Both tables show that the larger number of organisms are killed in the first five minutes, the more resistant ones gradually being killed off by a longer exposure.

Compare these results with Tables 25 and 26, page 36.

ACTION ON FECES.

Its germicidal action having been determined against pure cultures, experiments were done to determine its value as a disinfectant of human excreta.

Human feces with urine added was thoroughly mixed with sufficient water so that there should remain no large clumps. A watery suspension from a number of forty-eight-hour agar slants of *B. pyocyaneus* was added to the mixture and well mixed in, this being done on account of the green color it shows in culture, which was used as an index of the destruction of the nonspore-bearing organisms. To an accurately measured quantity of this mixture sufficient formalin was added so as to give a 3 per cent, 5 per cent, or 10 per cent dilution by volume of formalin. Plants were made into broth tubes and agar, which latter were at once poured into petri dishes. The growth in the broth tubes was observed for ten days; the colonies on the plates were counted on the fourth day.

Where the letter "P" appears pyocyaneus, as shown by the characteristic color, was noted.

TABLE No. 31.—*Feces and B. pyocyaneus, 3 per cent formalin, 37.2 per cent aldehyde.*

[* An anærobic spore-bearing rod.]

Time.	Number of colonies grown.	Days' growth in broth tubes.									
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Raw	Innumerable, P	+P									
At once	Not counted	+P									
10 minutes	273			+							
20 minutes	26			+							
30 minutes	6				+						
40 minutes	4				+						
50 minutes	3				+						
60 minutes						+*					
90 minutes						+*					
120 minutes						+*					

TABLE No. 32.—*Feces and B. pyocyaneus, 5 per cent formalin, 37.2 per cent aldehyde.*

[* An anærobic spore-bearing rod.]

Time.	Number of colonies grown.	Days' growth in broth tubes.									
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Raw	Innumerable, P	+P									
At once	Almost innumerable; not counted	+P									
10 minutes	73			+							
20 minutes	14				+						
30 minutes	6				+						
40 minutes	3				+						
50 minutes						+*					
60 minutes						+*					

TABLE No. 33.—*Feces and B. pyocyaneus, 10 per cent formalin, 37.2 per cent aldehyde.*

[* An anærobic spore-bearing rod.]

Time.	Number of colonies grown.	Days' growth in broth tubes.									
		1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
Raw	Innumerable, P	+P									
At once	Very few, "spreaders"	+									
10 minutes	6		+								
20 minutes	3			+							
30 minutes	1			+							
40 minutes					*						

A look at the above tables shows that in all three dilutions the maximum effect is exerted within the first ten minutes. In the 10 per cent dilution the great majority of the bacteria are killed almost immediately; *B. pyocyaneus* was killed in the 3 and 5 per cent dilutions in less than ten minutes and at once in the 10 per cent.

The deodorant action of formalin is an important consideration when used for the disinfection of feces; they are almost completely deodorized at once by a 10 per cent solution; a 5 per cent solution does not completely deodorize, but renders them almost inoffensive in a few minutes. There seems to be but little difference in the deodorant action of a 3 and a 5 per cent solution.

On account of its germicidal efficiency and deodorant action formalin would seem to be one of the most useful agents for the disinfection of infected human discharges when used in a 10 per cent dilution, allowing an exposure of one hour after thorough mixing.

DISINFECTION OF SPUTUM.

In order to determine the efficiency of formalin for the destruction of tubercle bacilli in sputum the following experiment was done:

Ten cubic centimeters of sputa from an advanced case of pulmonary tuberculosis was added to 180 cubic centimeters of sterile water, and the mass of sputum broken up as much as possible. An amount of the mixture of sputum and water equal to that used to inoculate the guinea pigs after exposure to formalin was given to a guinea pig as a control. Sufficient formalin was added to the sputum to make a 5 per cent solution by volume. At intervals of fifteen minutes up to one hour a small amount was given to a guinea pig intraperitoneally, with the following result:

TABLE No. 34.

Time.	Death in—	Post-mortem findings.
15 minutes	71 days	Generalized tuberculosis.
30 minutes	31 days	Do.
45 minutes	72 days.	Do.
60 minutes	Killed 5 months later	No indication of tuberculosis; had gained in weight.

The control pig died in thirty-five days with lesion of generalized tuberculosis.

The experiment was repeated with another specimen of sputum with practically the same result.

It would seem from the above that 5 per cent formalin in one hour was sufficient to render tuberculous sputum harmless to a guinea pig.

ACTION OF FORMALIN ON TETANUS AND DIPHTHERIA TOXINES.

Aronson (49) called attention to the fact that formalin, in the proportion of 1 to 500, added to diphtheria toxine, was sufficient to protect a guinea pig against 100 fatal doses of the toxine.

Burckhard (50) found that formalin, when added to tetanus toxine in the proportion of 1 to 250, was sufficient to protect a mouse against a dose of tetanus toxine that caused the death of the control in twenty-four hours. Burckhard does not seem to have determined the least fatal dose of his tetanus toxine.

Neither of them states how long the formalin was left in contact with the toxine before it was injected into the animal. My work on the action of formalin was all tested on guinea pigs, and the MLD of ‘ines accurately determined.

TABLE No. 35.—*Showing the effect of different percentages of formalin on tetanus toxine, six hours' exposure.*

Date.	Weight guinea pig.	Dose in MLDs.	Time exposed, in hours.	Formalin.	Result.		
					Death.		Recovery.
					Days.	Hours.	
	Grams.			*Per cent.*			
March 1, 1907	520	100	6	1	2	1	.....
Do.	375	100	6	2	3	8	.....
Do	400	100	6	3	4	4	.....
Do	390	100	6	4	7	6	.....
Do	400	100	6	5	.....	.....	+

TABLE No. 36.—*Showing the effect of different percentages of formalin on tetanus toxine, twenty-four hours' exposure.*

Date.	Weight guinea pig.	Dose in MLDs.	Time exposed, in hours.	Formalin.	Result.		
					Death.		Recovery.
					Days.	Hours.	
	Grams.			*Per cent.*			
March 1, 1907	520	100	24	1	4	21	.....
Do	500	100	24	2	14	0	.....
Do	510	100	24	3	.....	.....	+
Do	410	100	24	4	.....	.....	+
Do	530	100	24	5	.....	.....	+

TABLE No. 37.—*Showing the effect of 3 per cent formalin on tetanus toxine, after exposure of from one to six hours.*

Date.	Weight guinea pig.	Dose in MLDs.	Time exposed, in hours.	Formalin.	Result.		
					Death.		Recovery.
					Days.	Hours.	
	Grams.			*Per cent.*			
March 6, 1907	325	100	1	3	2	11	.....
Do	320	100	2	3	4	4	.....
Do	335	100	3	3	4	16	.....
Do	315	100	4	3	5	8	.....
Do	360	100	5	3	5	0	.....
Do	385	100	6	3	6	4	.....

Two control guinea pigs for the above three series died in twenty-seven and twenty-eight hours, respectively.

TABLE No. 38.—*Showing the effect of different percentages of formalin on diphtheria toxine after six hours' exposure.*

Date.	Weight guinea pig.	Dose in MLDs.	Time exposed, in hours.	Formalin.	Result.		
					Death.		Recovery.
					Days.	Hours.	
	Grams.			*Per cent.*			
March 1, 1907	400	200	6	1	1	6	.....
Do	390	200	6	2	3	13	.....
Do	375	200	6	3	7	9	.....
Do	400	200	6	4	20	0	Paralysis.
Do	425	200	6	5	20	0	Do.

TABLE No. 39.—*Showing the effect of different percentages of formalin on diphtheria toxine after twenty-four hours' exposure.*

Date.	Weight guinea pig.	Dose in MLDs.	Time exposed, in hours.	Formalin.	Result.		
					Death.		Recovery.
					Days.	Hours.	
	Grams.			*Per cent.*			
March 1, 1907	430	200	24	1	23	0	Paralysis.
Do	420	200	24	2	25	0	Do.
Do	370	200	24	3	.....	.....	+
Do	390	200	24	4	.....	.....	+
Do	370	200	24	5	.....	.....	+

TABLE No. 40.—*Showing the effect of 3 per cent formalin on diphtheria toxine, after exposure for various lengths of time.*

Date.	Weight guinea pig.	Dose in MLDs.	Time exposed, in hours.	Formalin.	Result.		
					Death.		Recovery.
					Days.	Hours.	
	Grams.			*Per cent.*			
March 16, 1907	420	200	1	3	1	13	.....
Do	420	200	2	3	4	8	.....
Do	420	200	3	3	4	8	.....
Do	430	200	4	3	4	15	.....
Do	435	200	5	3	4	4	.....
Do	440	200	6	3	4	17	.....

Two control pigs with the toxine alone died in seventeen and nineteen hours, respectively.

A study of the above tables shows that when tetanus toxine is exposed to 5 per cent formalin for six hours a guinea pig is able to withstand 100 MLD of this formalinized toxine; that 3 per cent formalin after twenty-four hours' exposure protects against the toxine; that 3 per cent formalin after one hour destroys a part of the toxine, and that its action increases with the length of exposure.

Diphtheria toxine is more susceptible than tetanus toxine, as 4 per cent formalin after six hours' exposure protects a guinea pig against acute death, paralysis, however, not being prevented. One per cent, after twenty-four hours' exposure, has the same effect. Its action against the toxine increases with the length of exposure.

This action of formalin on toxine is an important property in its use as a disinfectant, for not only are the bacteria themselves destroyed, but their soluble products as well.

Attempts have been made to treat certain septicemic conditions by means of the intravenous injection of weak formalin solutions, but without much success. Perhaps more success would attend its use in localized infections where there is a nest of germs elaborating a toxine which is absorbed and distributed throughout the system. This phase of the subject, it is hoped, will be treated in a later paper.

SUMMARY AND CONCLUSIONS.

Formalin in the proportion of 1 to 5,000 was sufficient to restrain all bacterial growth in bouillon contaminated with garden earth. Molds developed in a dilution of 1 to 1,000.

In a dilution of 1 to 4,000 formalin restrains bacterial growth in bouillon contaminated with stable manure.

A dilution of 1 to 4,000 restrains bacterial growth in bouillon contaminated with wisps of hay. Molds developed in a dilution of 1 to 1,000.

Summary showing lowest dilution in which all visible growth of pure cultures was restrained.

Organism.	Dilution in which growth was restrained.
Staphylococcus epidermidis albus	1 to 4,000
Staphylococcus pyogenes albus	1 to 3,000
Staphylococcus pyogenes aureus	1 to 3,000
Staphylococcus pyogenes citreus	1 to 3,000
Bacillus typhosus	1 to 3,000
Bacillus coli communis	1 to 3,000
Bacillus dysenteriæ (Shiga)	1 to 4,000
Bacillus pyocyaneus	1 to 3,000
Bacillus mallei	1 to 6,000
Bacillus anthracis	1 to 4,000
Bacillus pestis	1 to 5,000
Bacillus megaterium	1 to 6,000
Bacillus subtilis	1 to 3,000
Bacillus prodigiosus	1 to 3,000
Bacillus acidi lactici	1 to 6,000
Bacillus proteus	1 to 6,000
Bacillus enteritidis	1 to 3,000
Bacillus diphtheriæ	1 to 5,000
Vibro choleræ	1 to 6,000

One per cent formalin (containing 37.2 per cent aldehyde) killed the vibrio of cholera in ten minutes, B. coli in ninety minutes, B. diphtheriæ in twenty minutes, B. mallei in ten minutes, B. pyocyaneus in forty minutes, B. dysenteriæ and Staphylococcus albus grew up to two hours, and Staphylococcus pyogenes aureus and B. typhosus were killed in ninety minutes.

Two per cent formalin (containing 37.2 per cent aldehyde) killed B. coli after sixty minutes' exposure, B. diphtheriæ after ten minutes, B. pyocyaneus ten minutes, B. dysenteriæ sixty minutes, Staphylococcus pyogenes albus sixty minutes, and Staphylococcus pyogenes aureus and B. typhosus after forty minutes.

Three per cent formalin (containing 37.2 per cent aldehyde) killed B. coli after thirty minutes' exposure, B. dysenteriæ forty minutes, Staphylococcus pyrogenes albus thirty minutes, Staphylococcus pyogenes aureus twenty minutes, and B. typhosus after twenty minutes.

Five per cent formalin (containing 37.2 per cent aldehyde) killed B. coli and Staphylococcus pyogenes albus after thirty minutes' exposure, B. dysenteriæ after forty minutes, Staphylococcus pyogenes aureus and B. typhosus after twenty minutes.

Ten per cent formalin (containing 37.2 per cent aldehyde) killed all the nonspore-bearing organisms tested in less than ten minutes, except B. dysenteriæ and Staphylococcus pyogenes aureus, which were killed after ten minutes.

With a 2 per cent solution of formaldehyde the maximum germicidal effect was exerted in the first five minutes.

With a 3 per cent solution this immediate effect is more apparent, and in the case of B. pyocyaneus the great mass of organisms is killed in the first two minutes.

A 3 per cent solution destroys a great majority of the nonspore-bearing organisms in feces in the first ten minutes; a few, however, resisting a somewhat longer exposure; the spore-bearing organisms grew up to one hundred and twenty minutes.

Five per cent formalin acting upon feces destroyed most of the nonspore-bearing organisms within ten minutes; a few resisted forty minutes. The spore-bearing organisms resisted as long as sixty minutes.

Feces exposed to 10 per cent formalin solution were rendered practically sterile immediately; a few colonies developed in ten minutes. The spore-bearing organisms were destroyed after forty minutes.

A 10 per cent solution of formalin completely deodorized feces at once. A 3 and 5 per cent solution renders them almost odorless after a very few minutes' exposure.

On account of its germicidal efficiency and deodorant action formalin would seem to be one of the most useful agents for the disinfection of infected human discharges when used in a 10 per cent dilution, allowing an exposure of one hour after thorough mixing.

Tubercle bacilli in tuberculous sputum were killed after an exposure to 5 per cent formalin for sixty minutes. Sputum exposed for fifteen, thirty, and forty-five minutes, respectively, still contained live virulent tubercle bacilli.

When tetanus toxine is exposed to 5 per cent formalin for six hours a guinea pig is able to withstand 100 MLD of this formalinized toxine. Three per cent formalin after twenty-four hours exposure protects against the toxine; it destroys a part of the toxine in one hour, its action increasing with the length of exposure.

Diphtheria toxine is more susceptible than tetanus toxine, as 4 per cent formalin, after six hours exposure, protects a guinea pig against acute death; paralysis, however, is not prevented. One per cent, after twenty-four hours exposure, has the same effect. Its action against the toxine increases with the length of exposure.

This action of formalin on toxine is an important property in its use as a disinfectant, for not only are the bacteria themselves destroyed, but their soluble products as well.

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The Hygienic Laboratory was established in New York, at the Marine Hospital on Staten Island, August, 1887. It was transferred to Washington, with quarters in the Butler Building, June 11, 1891, and a new laboratory building, located in Washington, was authorized by act of Congress March 3, 1901.

The following *bulletins* [Bulls. Nos. 1–7, 1900 to 1902, Hyg. Lab., U. S. Mar.-Hosp. Serv., Wash.] have been issued:

No. 1.—Preliminary note on the viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 2.—Formalin disinfection of baggage without apparatus. By M. J. Rosenau.

No. 3.—Sulphur dioxid as a germicidal agent. By H. D. Geddings.

No. 4.—Viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 5.—An investigation of a pathogenic microbe (*B. typhi murium* Danyz) applied to the destruction of rats. By M. J. Rosenau.

No. 6.—Disinfection against mosquitoes with formaldehyde and sulphur dioxid. By M. J. Rosenau.

No. 7.—Laboratory technique: Ring test for indol, by S. B. Grubbs and Edward Francis; Collodium sacs, by S. B. Grubbs and Edward Francis; Microphotography with simple apparatus, by H. B. Parker.

By act of Congress approved July 1, 1902, the name of the "United States Marine-Hospital Service" was changed to the "Public Health and Marine-Hospital Service of the United States," and three new divisions were added to the Hygienic Laboratory.

Since the change of name of the Service the bulletins of the Hygienic Laboratory have been continued in the same numerical order, as follows:

No. 8.—Laboratory course in pathology and bacteriology. By M. J. Rosenau. (Revised edition March, 1904.)

No. 9.—Presence of tetanus in commercial gelatin. By John F. Anderson.

No. 10.—Report upon the prevalence and geographic distribution of hookworm disease (uncinariasis or anchylostomiasis) in the United States. By Ch. Wardell Stiles.

No. 11.—An experimental investigation of *Trypanosoma lewisi*. By Edward Francis.

No. 12.—The bacteriological impurities of vaccine virus; an experimental study. By M. J. Rosenau.

No. 13.—A statistical study of the intestinal parasites of 500 white male patients at the United States Government Hospital for the Insane; by Philip E. Garrison, Brayton H. Ransom, and Earle C. Stevenson. A parasitic roundworm (*Agamomermis culicis* n. g., n. sp.) in American mosquitoes (*Culex sollicitans*); by Ch. Wardell Stiles. The type species of the cestode genus *Hymenolepis;* by Ch. Wardell Stiles.

No. 14.—Spotted fever (tick fever) of the Rocky Mountains; a new disease. By John F. Anderson.

No. 15.—Inefficiency of ferrous sulphate as an antiseptic and germicide. By Allan J. McLaughlin.

No. 16.—The antiseptic and germicidal properties of glycerin. By M. J. Rosenau.

No. 17.—Illustrated key to the trematode parasites of man. By Ch. Wardell Stiles.

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No. 19.—A method for inoculating animals with precise amounts. By M. J. Rosenau.

No. 20.—A zoological investigation into the cause, transmission, and source of Rocky Mountain "spotted fever." By Ch. Wardell Stiles.

No. 21.—The immunity unit for standardizing diphtheria antitoxin (based on Ehrlich's normal serum). Official standard prepared under the act approved July 1, 1902. By M. J. Rosenau.

No. 22.—Chloride of zinc as a deodorant, antiseptic, and germicide. By T. B. McClintic.

No. 23.—Changes in the Pharmacopœia of the United States of America. Eighth Decennial Revision. By Reid Hunt and Murray Galt Motter.

No. 24.—The International Code of Zoological Nomenclature as applied to medicine. By Ch. Wardell Stiles.

No. 25.—Illustrated key to the cestode parasites of man. By Ch. Wardell Stiles.

No. 26.—On the stability of the oxidases and their conduct toward various reagents. The conduct of phenolphthalein in the animal organism. A test for saccharin, and a simple method of distinguishing between cumarin and vanillin. The toxicity of ozone and other oxidizing agents to lipase. The influence of chemical constitution on the lipolytic hydrolysis of etheral salts. By J. H. Kastle.

No. 27.—The limitations of formaldehyde gas as a disinfectant with special reference to car sanitation. By Thomas B. McClintic.

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No. 29.—A study of the cause of sudden death following the injection of horse serum. By M. J. Rosenau and John F. Anderson.

No. 30.—I. Maternal transmission of immunity to diphtheria toxin. II. Maternal transmission of immunity to diphtheria toxin and hypersusceptibilty to horse serum in the same animal. By John F. Anderson.

No. 31.—Variations in the peroxidase activity of the blood in health and disease. By Joseph H. Kastle and Harold L. Amoss.

No. 32.—A stomach lesion in guinea pigs caused by diphtheria toxin and its bearing upon experimental gastric ulcer. By M. J. Rosenau and John F. Anderson.

No. 33.—Studies in experimental alcoholism. By Reid Hunt.

No. 34.—I. *Agamofilaria georgiana* n. sp., an apparently new roundworm parasite from the ankle of a negress. II. The zoological characters of the roundworm genus *Filaria* Mueller, 1787. III. Three new American cases of infection of man with horse-hair worms (species *Paragordius varius*), with summary of all cases reported to date. By Ch. Wardell Stiles.

No. 35.—Report on the origin and prevalence of typhoid fever in the District of Columbia. By M. J. Rosenau, L. L. Lumsden, and Joseph H. Kastle (including articles contributed by Ch. Wardell Stiles, Joseph Goldberger, and A. M. Stimson).

No. 36.—Further studies upon hypersusceptibility and immunity. By M. J. Rosenau and John F. Anderson.

No. 37.—Index-catalogue of medical and veterinary zoology. Subjects: Trematoda and trematode diseases. By Ch. Wardell Stiles and Albert Hassall.

No. 38.—The influence of antitoxin upon post-diphtheritic paralysis. By M. J. Rosenau and John F. Anderson.

No. 39.—The antiseptic and germicidal properties of solutions of formaldehyde and their action upon toxines. By John F. Anderson.

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TREASURY DEPARTMENT

Public Health and Marine-Hospital Service of the United States

WALTER WYMAN, Surgeon-General

HYGIENIC LABORATORY.—BULLETIN No. 40

M. J. ROSENAU, Director

May 25, 1908

1.—The Occurrence of a Proliferating Cestode Larva (*Sparganum proliferum*) in Man in Florida. By Ch. Wardell Stiles.

2.—A Reexamination of the Type Specimen of *Filaria restiformis* Leidy, 1880=*Agamomermis restiformis*, By Ch. Wardell Stiles.

3.—Observations on Two New Parasitic Trematode Worms: *Homalogaster philippinensis* n. sp., *Agamodistomum nanus* n. sp. By Ch. Wardell Stiles and Joseph Goldberger.

4.—A Reexamination of the Original Specimen of *Tænia saginata abietina* (Weinland, 1858). By Ch. Wardell Stiles and Joseph Goldberger.

WASHINGTON

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SUMMARY.

This bulletin contains four articles on parasitic worms.

I. A very peculiar case of parasitism in man in Florida has been found by Doctor Gates, of Manatee. The worms, which live in the subcutaneous tissue and cause an acnelike swelling, have been determined as very closely related to, perhaps identical with, *Sparganum proliferum;* this parasite has been reported on only one former occasion (1905), when it was found in Japan; its life history, source of infection, prevention, and treatment are still unknown; its chief peculiarity is a reproduction in its larval stage by means of forming supernumerary heads, which may become independent and wander through the tissue.

II. *Filaria restiformis* is a worm described as a parasite from man. The original specimen has been found and restudied. It proves to be an immature horse hair worm and it is therefore exceedingly doubtful whether it was a parasite of man.

III. Some parasites referred to us by an official in Manila and Phrapatoom, collected from the cecum of cattle (*Bos* ——) prove to be a new species of trematode (*Homalogaster philippinensis*). Some parasites collected from the partridge (*Francolinus subtorquatus*) in West Africa by Dr. F. C. Wellman, and referred to us by the American Society of Tropical Medicine, prove to be an agamic encysted new species (*Agamodistomum nanus*) of trematode, rather closely related to the genus *Clinostomum*. It is impossible to state at present whether or not it is transmissible to man, but it does not agree with any form at present known for man; it is not known at present for any game or other birds in the United States.

IV. A few segments of the original specimen of *Tænia abietina* have recently been found. They are in very poor condition, and this precludes any final judgment as to their exact systematic position. They appear as a dwarfed specimen of *T. saginata*, yet there are certain indications which point to a difference from that species. For the present the form may perhaps best be viewed as a possible subspecies of *T. saginata*.

All bibliographic references are taken from Stiles and Hassall, Index-Catalogue of Medical and Veterinary Zoology, Authors, Bull. 39, U. S. Bureau of Animal Industry.

All drawings were prepared by Leonard H. Wilder, artist of this laboratory.

THE OCCURRENCE OF A PROLIFERATING CESTODE LARVA (SPARGANUM PROLIFERUM) IN MAN IN FLORIDA.[a]

By CH. WARDELL STILES, Ph. D.,

Chief of Division of Zoology, Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

(Figs. 1 to 18.)

MEDICAL HISTORY OF THE CASE.—In June of this year (1907), I received from Dr. H. Gates, of Manatee, Fla., specimens of worms, for identification, which he had taken from the skin of a man. The following extracts from Doctor Gates's letters give all that is known to me regarding the medical history of the case. In connection with this history, it will be well to abstract in considerable detail an account of a very similar case recently reported by Ijima (1905) in Tokyo, Japan.

Gates's case.—Inclosed find specimens of worms from human flesh. They are inclosed in sacks deep under the skin in the connective tissue. My patient has thousands of them all over the trunk; they can be seen and felt as nodules; deeper in the connective tissue in the left groin and left breast there seem to be large masses of them. I send some I obtained by cutting open the nodules and squeezing them out, and others still in the cyst as I found them.—From letter dated June 17, 1907.

In reply to your request for history, etc., of patient (J. W. M.) infected with larval tapeworm, I would state that I first discovered the condition in April of this year. I was called in to treat him for dysentery. While examining over abdomen I found a great many nodules in the skin and also in the fascia between the skin and the muscles. Deep down in the abdominal cavity I found large and small tumors, some movable and others fixed by adhesions. All the lymphatic glands on the side most infected were enlarged and in masses, as if they had formed close union with surrounding tissue.

The muscles were exempt from nodules, but soft and flabby. I opened one nodule near the surface and obtained two worms. Most of the nodules on the

[a] This article forms part of a paper which, by permission of the Surgeon-General, was presented upon invitation before the Sixth International Dermatological Congress, in New York, September 9–15, 1907.

skin are about the size and shape of grains of rice. When they first appear there is an itching produced. The cyst is filled with a clear watery fluid in which is found the small worm. In a few days a cyst wall is formed, surrounding the worm, which lies in a jelly or slime like substance. After weeks or months the cyst wall becomes firm, and surrounds one or more worms. In some cysts I have found as many as three worms. In the course of a few months the cyst wall breaks and there is nothing left but, sometimes, a blue spot showing a small hemorrhage; after this is absorbed, there will be only a spot of indurated tissue to mark the place. The places that have been infected the longest appear as a mass of indurated skin and fascia closely connected so that the skin can be picked up only with the mass of worm and tissue.

Patient is now 48 years old. He came to Florida in 1872 from Minnesota and settled with his father on a point on the Manatee River, now known as Manns Point, which was accessible to fish and oysters.

When 23 years old, while hunting in the woods about 1½ miles from the coast, he noticed a small pimple on the left shoulder, which attracted his attention because of the itching. He thought the skin had been punctured by a thorn. He squeezed the lump, from which came a small flat worm about ⅛-inch wide and ⅝-inch long. One year after the first appearance on the shoulder, he noticed four or five small lumps on his chest; these he opened with a knife and he picked out the same kiud of worms; these swellings also had produced an itching sensation. Patient was then living as fisherman on Sarasota Bay.

While fishing, patient's diet consisted of smoked and dried fish, raw oysters, scallops, and clams. Up to five or six years ago he was a robust, healthy specimen of manhood, but lacked energy. At present he has a tired expression, has less energy, and becomes exhausted after little exertion.

From the photographs (figs. 1–2) you will see enlargement of the left breast and shoulder; also of left groin and lumbar region. Spleen and liver are enlarged.

The infection is slight on the right side.

Patient has a wife and five children, all of whom are healthy.

There probably was another case similar to this a few years ago in this county. I have been trying to obtain a history of it, but have failed thus far. The man moved from here to California, where he died. The report was that he was eaten up with worms before he died.—Extracts from letter, August, 1907.

Japanese case.—The patient was a Japanese woman, Yae Tanaka by name, resident in Tokyo or immediate vicinity. Before her marriage to a dealer in old furniture she was a weaver, "occupations which place her decidedly in the lower class of society."

At the age of 33 years, in the spring of 1904, she visited the University Hospital at Tokyo for treatment for left inguinal hernia, entering the surgical wards of Dr. J. Kondo. This hernia was traceable to the presence of parasites in the region of the ligamentum poupartii. In addition to the hernia, she presented a peculiarly swollen condition of the integument, which bore scattered spots of acnelike appearance. This abnormal condition extended over nearly the entire body, except on the face and upper extremities; it was most prominent on the left thigh, which was greatly swollen and presented very much the appearance of elephantiasis, although the skin and underlying tissues were quite soft, so that they hung down by their own weight and could be grasped in a flaccid mass by the hand.

When 25 years old the patient had a tapeworm, the species of which is not known. The dermal affection was first felt when she was 31 years old, so that at time of entrance to hospital it was of about two years' standing. It had given no particular trouble beyond that imposed upon motion by the

swollen thigh and the itching of the skin in parts where a pimplelike hardening made its appearance; scratching with the nails, in order to allay the itching, had led to breaking the skin, from which a soft whitish mass, together with some fluid, could be pressed out. A number of resulting recent scars, especially on the breasts, were visible.

In preparations, made of skin taken from the left thigh, Ijima became convinced of the presence in the connective tissue of numerous encapsuled worms, the cestode nature of which was recognized from the calcareous corpuscles.

On each of two subsequent occasions, July 9 and 24, 1904, a very large piece of skin, with the underlying connective tissue, was excised from the left thigh, in order to relieve the patient of the superfluous tissue. Altogether several pounds in weight were removed during the patient's stay at the hospital.

When freshly excised the subcutaneous tissues presented an unusual appearance. At places several centimeters thick they were moderately rich in panniculus adiposus and extraordinarily rich in lymph; the latter swelled the connective tissue between the panniculi, giving it a slimy or gelatinous appearance and consistency; the slimy character seemed more manifest in the deeper parts; lymph exuded copiously from the cut surfaces; numerous capsules, with the contained worm, were observable as whitish objects, isolated or in clusters, in all parts of the tissues. The thickness of tissues between the surface and the underlying tissue measures 30 to 60 mm., notwithstanding the fact that the hardening process has contracted the subcutaneous connective tissue, through loss of the lymph, into dense fibrous bundles, so that it no longer bears a resemblance to what it was in the fresh state. The corium in the same piece may be said to be 3 to 6 mm. thick; it seems to be on the whole considerably thicker than in the normal state.—Abstracted from Ijima, 1905, pp. 1–21.

Further medical details are not given by Ijima, but he states that Professor Kondo will publish a report of clinical and pathological observations. I have not as yet learned of the publication of the report in question.

From the foregoing abstracts the suspicion immediately arises that in Florida we have a skin infection, hitherto unrecognized for the American continent, and similar to, perhaps identical with, an infection recognized only on one former occasion, namely, in Japan.

It is interesting to note the following comparison in the cases, without laying too much stress upon these points at present:

Both cases occurred near the eastern shore of the continents in question (Old World, between 35° and 36° N., and New World, between 27° and 28° N.); both patients lived in or near cities or towns located directly on the water, very near larger bodies of water (Pacific Ocean and Gulf of Mexico); both patients, though of different sex, were adult (23 years, male; 31 years, female) when the infection was first noticed; both patients belonged to the poorer class of society; one had a professedly fish diet, the other lives in a country where a fish diet is very common; both infections are of long standing (in one case over three years, in the other case about twenty-five years); in both cases the number of individual worms present was very great; both observers (Ijima for Japan and Gates for Florida) independently call attention to the acnelike lesion resulting from the infec-

tion: each patient is a native of the country in which the case was found, and in neither case is there any history given of the patient's having visited the country of the other patient.

NATURE OF THE PARASITE.—A microscopic examination of the worms forwarded by Doctor Gates showed them to contain calcareous corpuscles, hence the diagnosis of cestode infection was immediately established in this case on the same basis as was the diagnosis in the Japanese case. The cestode in question is a larval form, without suckers on the head, and, as far as seen, without any primordium of genital organs. The most striking feature of the worm is its irregular shape, with tendency to proliferation by forming supernumerary heads. These characters immediately bring up for consideration the question as to whether the worm found by Gates is identical with the parasite recently reported by Ijima (1905) for Japan. As the American and the Japanese parasites are very closely related, possibly specifically identical, it will be well to follow the two in comparison. In doing this it will be advisable to abstract Ijima's paper rather liberally, more especially since it is published in a journal not generally accessible to dermatologists.

The worm capsule of Ijima's parasite.—Ijima (1905, 4–5) states that the worm capsules of various sizes occur in abundance in all parts of the subcutaneous tissues and less abundantly in the corium. They were also observed in some numbers in the intermuscular connective tissue, but not in the muscles themselves, so far as such observation could be made on parts incidentally exposed during the surgical operation. In the corium the capsule may be situated so close to the epidermis that the latter is externally raised into an acnelike prominence. On a piece of the preserved skin about 2 inches square, Ijima found at least four such prominences, which, as seen on the surface, appear smooth and less pigmented than the surrounding parts. Capsules so superficially situated might easily be ruptured by force applied through the skin from without.

In shape the capsules are generally subspherical or ovoid. While the smallest of them are considerably less than 1 mm., others measuring 1 to 2 mm. or more are of quite common occurrence; one of the largest sent was elongate, 3.5 mm. broad by 5 mm. long; another measured 3 mm. by 4 mm. The larger capsules were found only in the subcutaneous parts, not in the corium.

The capsular wall, consisting of a dense felt work of connective tissue fibers of the host, is usually nearly 0.3 mm. in thickness; in sections the capsules may appear somewhat like a transversely cut blood vessel with a thick and strong and compact looking wall; under a low power the inner surface of the capsule appears smooth; in some of the larger cysts the inner wall may be traversed by branching trabeculæ, and internally the wall often shows no special limit-

ing structure, or is lined with a deposit of granular coagulum or tissue débris.

Abundance of parasite.—In Doctor Gates's letter of June 17 he states that his " patient has thousands of " these parasites.

In the Japanese case a section of about 11 sq. cm. showed nearly 60 capsules; in the most thickly infested portions of the thigh there was one capsule to every 20 sq. mm. of cut surface, or to every 100 cub. mm. of infested tissue; this gives 1,000 capsules per 100 cub. cm. of tissue. It was estimated that there must have been considerably over 10,000 capsules in the left thigh alone.

Worms without capsules.—Scarely any of the worms Gates forwarded to me bore any remnant of the cyst. Very probably most of these specimens were originally encysted and were freed from their cyst by Doctor Gates before he forwarded them.

Comparatively young, slender worms were found by Ijima free in the connective tissue—that is, not surrounded by a capsule.—Ijima, 1905.

Movements of the worm.—Not having seen the worm alive, I can give no details regarding movements.

Ijima reports that the living worms when taken from the patient showed slow movements of extension and contraction, but effecting little or no change in position; upon cooling the worms no longer exhibited such movements; in case of worms placed in salt solution motion could be revived up to a period of four hours if the parasites were slightly warmed.

The head (narrow end) was the most motile, evaginating and invaginating at the apex, in addition to shortening and extending; the terminal, but inconstant, depression in some cases reminded the observer of a terminal sucker, such as seen in the fish bothriocephalid *Cyathocephalus.* In addition to a motion as if feeling about, the head started a lively peristalsis from before backward; such combined movements would aid the worm in penetrating and moving through tissues.

The broader parts of the body showed at most slow vermiform movements, with more or less constant indentation at the extreme hind end.

The head.—Ijima states that the head of his parasite is devoid of any definitely formed or permanent organ of attachment. This holds true also for the worm found by Gates. In some few specimens a slight apical depression is observed, but as the material is preserved in alcohol this might possibly be either an artifact or a depression due to sudden contraction on the part of the worm.

Encysted worms.—Gates writes that he found as many as 3 worms in one cyst. This condition is doubtless due, as Ijima explains also for his case, to the tendency of the worm to multiply by budding.

Ijima reports that the smaller capsules usually contained only a single worm; in the larger cysts, however, 2 or more worms or pieces were more frequently found; from one capsule 5 worms were obtained, and from another 7 worms.

Size and shape.—The longest specimen I have observed is 12 mm. in length. Some of the worms are simple elongated bodies, either more or less flattened, or nearly round in transverse section. The larger specimens, however, assume all manner of bizarre and irregular shapes which can not be well described. These variations in form may be reduced to a progressive but irregular formation of buds, the apex of each bud representing a structure similar to the cephalic end of the original worm; the form varies, of course, according to the number, position, contraction, etc., of the buds, and according to the contraction of the parent stock. Figures 5 to 15 will give an idea of the great variety of forms found.

According to Ijima, many of the worms are small, filiform, about 0.3 mm. in diameter, 3 mm. in length; others attain, even when moderately contracted, 12 mm. long by 2.5 mm. broad. In some specimens the body is flattened dorsoventrally, but there is no clew as to which is the dorsal and which is the ventral surface. In its simplest form the worm is plerocercuslike, or narrow at the head and broader caudad when moderately contracted, or irregularly cylindrical when strongly contracted.

This simple plerocercuslike larva, when encysted, may assume a rather complicated structure, due to its ability to form buds or supernumerary heads, especially on the lateral edges of the flattened body in younger specimens, but quite irregularly in the more complicated older forms. When the heads detach themselves they represent small independent plerocercuslike larvæ, and their method of formation explains the presence of several worms in one cyst.

The formation of heads in the manner described naturally tends to give the worms a very irregular outline; this irregularity is increased by the formation of subcuticular bodies, which Ijima interprets as food material. Ijima assumes that these young heads leave the capsule and wander through the connective tissue until they grow in size, and then in turn form a capsule of their own.

Microscopic anatomy.—According to Ijima, the cuticule of the Japanese form may attain 8μ in thickness; the dermal musculature consists of external circular and internal longitudinal fibers. These statements are correct as applied to the Florida form also.

The *calcareous corpuscles* of the Japanese worm are described by Ijima as spherical or ellipsoidal, 7.5 to 12μ in diameter, and abundant in all parts of the parenchyma, except in the head, in which they are lacking. In the Florida form also the calcareous corpuscles are abundant; they vary in size from 8.8 to 17.6μ; in shape they are

spherical to ellipsoidal. Thus, in reference to the size of the calcareous corpuscles, there seems to be a slight difference between the American and the Japanese parasites.

Reserve food bodies.—Ijima has described as present in the parenchyma certain bodies which he views as reserve food material. Usually they are roundish or oval, 100 to 300μ in diameter; but they may become very elongate.

In the Florida parasite similar bodies are present, but in the specimens thus far examined microscopically they do not seem to be quite so numerous or quite so large and prominent as described by Ijima for the Japanese form. It is possible, however, that this is a matter of individual variation.

Excretory system.—The parasites, as described by Ijima, contain an extensive system of anastomosing excretory vessels. In this respect the Florida form agrees with the Japanese species. Some of the canals are quite large, others are smaller, some are very small. Ijima calls attention to the absence of excretory vessels in the peripheral zone of the posterior part of the body; he also states that he was unable to find any opening.

In sections of one of the Florida parasites fine canals were found rather close to the cuticle, but because of the branched condition of the worm it is difficult to state just what portion of the body this was; it was not, however, a head. Likewise, in one case sections of a pore (fig. 18) on the surface, with a centripetally directed canal, were distinctly seen. In view of the absence of genital organs one is naturally inclined to look upon this pore as belonging to the excretory system.

The longitudinal muscles of the Japanese worm are described as well developed, and in addition there is a less strongly developed set of muscle fibers running in different directions but mainly in the transverse plane. Near the head these transverse muscles may be quite regular (some dorsoventral, others crossing these at right angles), but in thicker portions of the body they may become very irregular. This description applies in a general way to the Florida form also.

Nervous system.—Ijima noticed a pair of longitudinal, lateral nerve trunks in the cephalic portion; they seemed to unite close to the tip of the head. In several sections of the Florida worms nerves were distinguished, but details as to their topography were not studied.

Life cycle.—Experiments to raise the adult stage by feeding the Japanese parasites to cats, dogs, and pigs were negative.

As all of my own material was preserved no experiments could be undertaken. The question as to the source of infection, life cycle, etc., must be left open for the present.

SYSTEMATIC POSITION.—From the general structure, especially from the presence of calcareous corpuscles, it is clear that both the Japanese and the Florida parasites are cestodes; the absence of suckers seems to place both forms in the old family Bothriocephalidæ, now known as Dibothriocephalidæ. Further than this, the exact systematic position is not clear at present and can not well be determined until the adult stage is known.

So far as can be judged from the material thus far studied (prior to the meeting of the International Dermatological Congress in New York, September 9, 1907), the Florida form must be considered as very closely allied to, perhaps specifically identical with, the Japanese form. The only anatomical point of difference thus far brought out is a difference in size of the calcareous corpuscles; the only biological difference known is the habitat—in two widely separated localities.

Ijima points out the structural affinities between the Japanese form and the bothriocephalid larval *Sparganum* of Diesing; he refers also to the similarity between the Japanese form and "*Ligula mansoni*" (=*Sparganum mansoni*).

Sparganum is an artificial collective group of worms, distinctly proposed, not as a systematic unit, but as a collective group of larval bothriocephalid cestodes. Under the International Code of Nomenclature (1907) such names may be proposed as a matter of convenience and may be used as if they were generic names; they do not require any type species and hence do not compete with generic names under the law of priority.

Both the Japanese and the American parasite may be temporarily classified in *Sparganum*.

The Japanese worm was originally published under the two names *Plerocercoides prolifer* and *Plerocercus prolifer*, but Ijima distinctly states that he uses the names as a matter of convenience, namely, not in a taxonomic sense. Certain objections arise, however, to the use of the names *Plerocercus* and *Plerocercoides* in this connection, and on this account I transferred (1906a) the parasite to *Sparganum*.

The nomenclatural points involved are somewhat complex and it may be well to explain them in this place.

Under the original international code, the names of larval cestodes and of certain other forms were, for special reasons, exempted from the law of priority. Later (1901), contrary to the judgment of helminthologists, this exemption was done away with.

To apply the law of priority consistently to all such larval names would be almost an impossibility. There are, in fact, many names which have been proposed, not in a generic sense, but as names of admittedly artificial groups, which were used simply as a matter of

temporary convenience, and it was on account of a failure to distinguish between names of this category and names proposed for supposed genera that the exception was rescinded. In 1907, at the Boston congress, a helminthologist proposed the following, which was adopted as part of the code:

"Certain biological groups which have been proposed distinctly as collective groups, not as systematic units, may be treated for convenience as if they were genera, but they require no type species. Examples: *Agamodistomum*, *Amphistomulum*, *Agamofilaria*, *Agamomermis*, *Sparganum*."

As will be shown below, *Plerocercus* and *Plerocercoides* also now come under this paragraph. As matters now stand it is necessary to show that a name was distinctly proposed to designate an artificial collective group in order to bring it under this provision. A name like *Cysticercus* or *Echinococcus*, originally proposed as generic, not distinctly to cover an admittedly artificial group, is subject, now as before, to the law of priority.

The term *Plerocercus* (πλήρης, full; κέρκος, tail) was proposed by Braun (1883a, 98) as designation for the parenchymatous cysticerci (namely those the caudal portion of which contains no fluid) as distinguished from the bladder worms, or true cysticerci; thus it is a descriptive term for a stage of development (larva) possessing certain characters, but not the designation, of a systematic unit. As examples, Braun cited a *Plerocercus* [*Dithyridium lacertæ* Val.] of lizards and a *Plerocercus* of *Tetrarhynchus*. This plerocercus of the lizards happens to figure in a true nomenclatural sense, namely in the genus—

DITHYRIDIUM Rudolphi, 1819.

1819: *Dithyridium* Rud., 1819a, 559 (*lacertæ viridis, lacertæ muralis;* Europe. Type by later absolute tautonymy *Piestocystis dithyridium* = *Dith. lacertæ*).

1850: *Piestocystis* Dies., 1850a, 478, 494–496 (*Dithyridium* 1819, renamed; includes as valid species *P. crispa* (Rud.), *P. rugosa* Dies., *P. variabilis* Dies., *P. dithyridium* Dies., [for *Dithyridium* of Rud., namely *D. lacertæ* Valenciennes, 1844]).

This genus is based upon a larval tapeworm (a plerocercus) provided with four suckers, and is classified in the family Tæniidæ; the type species occurs in Europe in lizards of the genus *Lacerta*.

In 1866 Baillet mentioned a parenchymatous cysticercus (namely a plerocercus) from the abdominal cavity of the cat and the dog. In 1882 or 1883, Blumberg described this form as a new species under the name *Cysticercus elongatus;* the latter name however was already preoccupied (cf. *C. elongatus* Leuck., 1842). In 1885, Railliet renamed this form *Cysticercus bailleti*, and in 1893a, p. 314, he classi-

fied it in the genus *Dithyridium* as *D. elongatum.* In the meantime, however, Neumann (1892a, 537–539, figs. 292–293) referred to the same parasite as "*Plerocercoides bailleti*," clearly using a Latin binominal nomenclature.

The name *Plerocercoides* as used by Neumann is traceable to Braun (1883a, 100) who used a German term (" Plerocercoiden ") to designate certain larval forms which differed from the cysticercoids by having parenchymatous tails. As examples Braun cites a form which occurs in the body cavity of *Trichodectes canis*, and the young (*Gyporhynchus* of *Tænia macropeos* and *T. unilateralis.* Blanchard (1888a, 491) used a French form (*Plérocercoides*) of the word, while Neumann (1892a, 537) seems to have first used the Latin *Plerocercoides.* From Neumann's text, however, it is clear that he based his name on Braun's "Plerocercoiden;" hence Neumann's *Plerocercoides* is not a generic name but the designation of an artificial collective group; hence also the type designation (*bailleti*) suggested by myself in 1906 is not necessary under the new (1907) code.

As a plerocercus may be the larval form of species belonging to widely distinct families, even to different orders, it is wise not to use the combination *Plerocercus prolifer* in case a better designation is available; this point probably occurred to Ijima, for he used the combination only once. *Plerocercoides* is also open to the same objection, and in the only use of the term prior to Ijima it was used for a *Dithyridium.*

It so happens that Diesing proposed a name which is open to fewer objections. This is the

Collective Group SPARGANUM Diesing, 1850.

DIAGNOSIS.—*Dibothriocephalidæ:* An artificial collective group to contain larval stages of bothriocephalid worms which have not reached a stage in their development that they can be determined generically.

Such groups do not require a type species.

In 1906 I placed Ijima's form in this group as

The Proliferating Japanese Tapeworm Larva—SPARGANUM PROLIFERUM (Ijima, 1905) Stiles, 1906.

SPECIFIC DIAGNOSIS.—*Sparganum:* Larva may attain 1 to 12 mm. in length and 2.5 mm. in breadth; head narrower and more motile than posterior end and may show an apical depression which, perhaps, serves as sucker; no true suckers or other organs of attachment present. Calcareous corpuscles spherical or ellipsoidal, 7.5 to 12 μ (Japanese worm) or 8.8 to 17.6 μ (Florida worm) in diameter, and situated in any part of body except head; irregularly distributed reserve food bodies present in older specimens, but they later undergo disintegration; genital organs not present; longitudinal muscles better developed than either dorsoventral or transverse system; transverse fibers do not

divide body into cortical and medullary layers; excretory system well developed, consisting of larger approximately longitudinal branches, with anastomoses. The larvæ possess the power of multiplying by transverse fission and of forming supernumerary heads which may become independent. Adult unknown.

HABITAT.—Encysted in subcutaneous tissue and elsewhere in man.

GEOGRAPHICAL DISTRIBUTION.—Found but twice; once by Ijima in Tokyo, Japan; once by Gates in Manatee, Fla.

Whatever results may be obtained from examination of further material, which I could not study prior to the meeting of this Dermatological Congress, at the present time I do not feel justified in separating the American form specifically from the Japanese species, despite the difference in geographic distribution and the slight difference in the calcareous corpuscles. That the adult stage may eventually prove the Florida form to represent a distinct species seems entirely possible; in fact, when we consider the seeming isolation of the two cases this appears probable. At the same time, if it should eventually be shown that the infection was contracted from eating marine fish, the possibility would not be excluded that the two forms are identical, despite the wide difference in locality. In the interest of conservatism, accordingly, I classify for the present the two in the same species.

In an earlier paper (1906a, 86) I called attention to the fact that because of the remarkable reproduction of the larval stage described by Ijima a new genus would probably be justified. I hesitated somewhat to make the genus without seeing actual specimens. After examining the American specimens I am further convinced of the probability that the worm in question represents a new genus.

The proposition of a new generic name at this time presents both advantages and disadvantages. To continue to call the worm *Sparganum* shows that the family position is recognized, but that the adult is unknown; the worm is, however, so different from the other forms of *Sparganum* that it seems advisable to bring out this difference in a generic name; further, as long as a new generic name seems almost inevitable, it would appear wise to introduce it as soon as possible, in order to reduce its competition (through homonymy) in the future. On the other hand, to introduce a new combination at present does not seem absolutely necessary; its introduction would destroy the advantages we have at present in the use of the name *Sparganum*.

There is, I believe, a conservative method by which the advantages of both plans may be united, namely, by the introduction of a new subgeneric name. This course permits the continuation of the use of the name *Sparganum*, and at the same time brings out the fact that the worm is very different from the other forms of *Sparganum;*

further, it procures for the name any advantages in homonymy which may be gained by its proposal this year instead of later.

As such subgeneric name I propose—

GATESIUS[a] n. subg.

DIAGNOSIS.—*Dibothriocephalidæ,? Ligulinæ*, classified temporarily in *Sparganum:* Adult unknown. Larva in its simplest form similar to the plerocercus of *Dibothriocephalus*, except for suckers, which are not indicated; possesses the property of branching and of reproducing by budding, thus forming supernumerary heads which become free from parent and assume the simple plerocercoid form. Body contains numerous calcareous corpuscles, richly developed canal system, and may contain reserve food bodies.

TYPE SPECIES.—*Sparganum* (*Gatesius*) *proliferum* (Ijima, 1905) Stiles, 1908, from connective tissue of man; Japan.

It will be noticed that from the form of this proposal the name *Gatesius* is proposed not as a collective group, similar to *Sparganum*, but as a true systematic name of subgeneric rank. When the adult form becomes known the species should be taken out of the group *Sparganum* and this subgenus raised to generic rank.

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[a] Dedicated to Dr. H. Gates, of Manatee, Fla., who found the first American case.

A REEXAMINATION OF THE TYPE SPECIMEN OF FILARIA RESTIFORMIS LEIDY, 1880,= AGAMOMERMIS RESTIFORMIS.

By CH. WARDELL STILES, Ph. D.

Chief of Division of Zoology, Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

(Figs. 19 to 26.)

While examining some specimens in the Army Medical Museum with the late Dr. James Carroll, I found Leidy's original specimen of *Filaria restiformis*, reported as a parasite of man. As the parasite has been reported but once, and as little is known regarding its nature, I requested Major Carroll to place the specimen at my disposal for study. This he kindly did.

HISTORICAL REVIEW.—Leidy (1880c; 1904a, 157–159) received from Dr. J. J. Woodward, U. S. Army, a specimen of a worm which had been sent to the Army Medical Museum, Washington, D. C., by Dr. C. L. Garnett, of Buffalo, Putnam County, W. Va., together with the following extract from a letter:

> During the winter of 1876 a man, a common laborer, aged about 50, presented himself to me for treatment, having a gleety discharge from the urethra, with a burning sensation during and after micturition. Previously he had been treated for gonorrhœa, and I prescribed accordingly. The patient, not improving, applied to other practitioners. In April, 1878, he came to me with a round, vivid-red worm, 26 inches in length (the specimen you now possess), and very active in its movements, instantly coiling up like a watch-spring on being touched. Having no work on helminthology for reference, the only description I found which appeared to answer to the worm was that of *Strongylus gigas*, in Niemeyer, Vol. II, p. 47. The patient is an illiterate man, with no motive for deception. He informed me that he discovered the worm protruding from his penis and drew it out without pain or difficulty. He was in much agitation and alarm about the occurrence, fearing, as he said, that "there might be more behind that one." For a few days previous to its passage his urine was of a milky hue and some time subsequently of a yellow cast and slightly tinged with blood and mingled with mucus. The man is truthful, and no doubt exists in my mind or in the minds of his neighbors as to the correctness of his statements. I regret exceedingly that I did not appreciate the scientific interest of

the subject, and send you the specimen in a fresh state, but the busy routine of a country practitioner's life leaves no time for the study of other than subjects of practical value in one's everyday experience.

Leidy seems to have had some slight misgivings as to whether the worm actually represented a parasite of man, but he described it as a new species, with the following diagnosis:

Body long, restiform, nearly uniformly cylindrical, smooth, shining, elastic, tough, without evident annulation other than transverse wrinkling, with the anterior extremity evenly tapering in the continuous head, the end of which is rounded and smooth or without appendages of any kind; the posterior extremity not tapering, with the caudal end incurved, bluntly rounded, without appendages and imperforate or without evident anal or genital aperture. Mouth a terminal pore without lips, papillæ, or armature of any kind. Pharynx cylindrical and opening into a straight cylindrical intestine, apparently ending in a blind pouch. Generative organs unobserved. Length of worm 26 inches, greatest thickness 1.5 mm. Width of head just behind the rounded extremity 0.375 mm., opposite the commencement of the intestine 0.625 mm., at the middle 1.5 mm., at the incurved caudal extremity 1.5 mm. Length of esophagus 1.125 mm.

Leidy adds that the worm is clearly neither a *Gordius* nor a *Mermis*.

Neither the figures nor the description as given by Leidy seem to be strongly confirmatory of the determination of *Filaria*. In fact, the description and the figure of the esophagus give rise to the question whether the worm may not belong to the *Mermithidæ*, while the striation figured for the caudal end nearly establishes this point. Authors since 1880 have referred to *F. restiformis*, usually without expressing an opinion regarding the species, but Railliet (1893a, 530) and Penel (1905, 8) consider that it was probably a spurious parasite.

Bibliography.—1880: *Filaria restiformis* Leidy, 1880c, 130–132, figs. 1–2 (in *Homo;* West Virginia); 1904a, 157–159, 278.—R. Blanchard, 1890a, 13, fig. 390 a–b; 1895, 785.—Braun, 1883a, 184; 1895b, 227; 1903, 3 ed., 275.—Ijima, 1889b, 367.—Moniez, 1896, 359.—Penel, 1905, 8.—Railliet, 1893a, 530.—Stossich, 1897, 78.—Vaullegeard, 1901, 128.—Ward, 1895, 331; 1903, 704; 1903, 212.

Reexamination of Type.

Condition of material.—The worm is broken into several fragments and is not suitable to a detailed study. It was in alcohol when Doctor Carroll turned it over to me. It was next transferred to alcohol and glycerin; the alcohol was evaporated, and the fragments were studied in glycerin. Very few characters can be recognized, but sufficient was seen to exclude the worm from the genus *Filaria*.

General contour.—By placing the various fragments together figure 21 is obtained, showing the general appearance of the worm, natural size. It will be noticed that while the body is of nearly uniform diameter, the head is distinctly attenuated.

Cuticle.—The cuticle is about 32 μ thick on the anterior portion, 48 μ on the tail, and when focused sharply is seen to be composed of several concentric layers; this point is brought out clearly at the ends of the fragments and on transverse section. Sharp focus at high power shows in addition the distinct presence of a diagonal fiber system, such as is found in the *Mermithidæ*, and such as was clearly seen by Leidy and figured in his original publication.

Head.—The cephalic extremity is distinctly attenuated, as observed by Leidy, and then ends rather bluntly. The terminal mouth is very small, and without lips. Directly back of the mouth there are six papillæ, which can still be observed more or less distinctly. The presence of these papillæ definitely excludes the worm from the *Gordiidæ*. Unfortunately it is impossible to roll the head, as it is somewhat compressed, apparently dorsoventrally. Two of the papillæ seem, however, to be anterior of the other four; it seems probable, therefore, that the former are lateral; the latter the submedian papillæ.

About 442 μ back of the mouth a structure was seen which bore some resemblance to an excretory pore with canal. If, however, the position of the papillæ is correctly interpreted, this excretorylike structure would be lateral, hence this can hardly be the excretory pore, but is more probably an artifact.

Tail.—The tail is curved ventrally and is bluntly rounded. No anus was discernible. In the body could be seen a dark cecal structure. Caudal papillæ were not observed. It would appear, accordingly, that the specimen is either a female or that it is immature.

Esophagus.—In describing the intestine Leidy says: "Pharynx cylindrical and opening into a straight cylindrical intestine, apparently ending in a blind pouch." This description immediately suggests the *Mermithidæ*. The only other group which would seem to come into consideration would be *Dracunculus*, which might be considered as a possibility on the assumption that the structures were to be interpreted similarly to Looss's 1905, fig. 39, p. 183, of *Dracunculus medinensis*. Such interpretation is not in harmony, however, with the diagonal fibers of the cuticle.

From the mouth a distinct cuticular tube, 17.6μ to 26.4μ in diameter, cuticle 8μ, lumen 9 to 10.4μ, can be traced for some little distance; this tube evidently represents the cuticular lining of the esophagus, and it is surrounded by a somewhat indistinct body, evidently the esophagus, about 130μ in diameter.

At a point 0.88 mm. from the anterior extremity there is seen at one side of the esophageal cuticular lining a blind sack, directed cephalad, and apparently representing the fat body reported for the *Mermithidæ*.

Genital organs.—No genital organs can be discovered, so that the conclusion is drawn that the specimen is immature.

Cross section.—Advantage was taken of the fact that the specimen is in fragments to prepare transverse sections (fig. 26) of the end of one of the pieces. A careful histological study of the slides is precluded by the condition of the material. Nevertheless, some important anatomical observations are possible.

The cuticle consists of concentric layers. A subcuticula can also be distinguished more or less clearly. The muscles are divided into six fields, separated by the six longitudinal lines, but the finer structure of these lines can not be interpreted safely.

In view of the foregoing data it appears that *Filaria restiformis* should be transferred from the *Filariidæ* to the family *Mermithidæ*, as *Agamomermis restiformis*. Further, the idea that an error has occurred in interpreting this worm as a parasite of man seems to gain support, for it would be exceedingly difficult to explain the presence of a *Mermithidæ* in the bladder.

OBSERVATIONS ON TWO NEW PARASITIC TREMATODE WORMS: HOMALOGASTER PHILIPPINENSIS, AGAMODISTOMUM NANUS.

By CH. WARDELL STILES, Ph. D.,
Chief of Division of Zoology,
and
JOSEPH GOLDBERGER,
Passed Assistant Surgeon, Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

Among the parasites recently sent to us for identification are two interesting trematodes which appear to be new species. One of them (*Homalogaster philippinensis*) is an amphistome from the Philippines, the other (*Agamodistomum nanus*) a distome from Africa.

Genus HOMALOGASTER Poirier, 1883.

1883: *Homalogaster* Poirier, 1883, 74–76, 79 (m. *paloniæ*); ὁμαλός, flat; γαστήρ, stomach; 1885, 120. For bibliography see Stiles and Hassall, 1908, Index Cat., Trematoda, Bull. 37, Hyg. Lab., U. S. P. H. & M. H. S.

GENERIC DIAGNOSIS.—*Paramphistomidæ,? Cladorchinæ:*[a] Body divided into a large oval, anteriorly pointed, cephalic portion containing all of the inner organs, and a caudal portion composed of the large acetabulum. Dorsum convex. Venter flat or excavate, provided with alternating longitudinal rows of large mammalike structures; of these, the papillæ near the middle of the rows (both longitudinal and transverse) are larger than those further from the middle. Pharynx with two lateral pouches; esophagus present. Genital pore ventromedian, cephalad of testicles. Testicles in anterior half of body; ovary near acetabulum; vitellaria rather well developed, lateral of ceca, extending about from esophageal bifurcation to ovary. Egg with operculum.

HABITAT: Large intestine of ruminants.

TYPE SPECIES.—*Homalogaster paloniæ* Poirier, 1883.

Comparatively little work has been done on this genus. In fact, Fischœder was obliged to leave open certain questions in regard to the generic characters. With the new form here described, the genus contains three species. An effort to obtain the two known species for

[a] In a later paper we shall have occasion to discuss the subfamily position of this genus.

purpose of comparison has not been successful. The three species in question may be distinguished by the following key and diagnoses:

KEY TO THE SPECIES OF HOMALOGASTER.

1. Testicles placed obliquely; oral papillæ not reported; genital pore near equator of esophagus; type locality, Java.....*H. paloniæ* (p. 24).
2. Testicles, one caudad of the other; oral papillæ present; genital pore at equator of esophagus; type locality, Manila, P. I.
H. philippinensis (p. 25).
3. Testicles on same transverse plane and divided into 2 large equal lobes, simulating 4 testicles; oral papillæ present; genital pore caudad of bifurcation of intestine; type locality, Tonkin....*H. poirieri* (p. 24).

In view of the comparatively restricted knowledge of this genus it seems advisable to give our present data regarding the two species already described before passing to a discussion of the new form.

HOMALOGASTER PALONIÆ Poirier, 1883.

(Figs. 27 to 28.)

1883: *Homalogaster paloniæ* Poirier, 1883, 74–76, pl. 2, figs. 1a–b (cecum of *Palonia frontalis;* from Java).—For bibliography see Stiles and Hassall, 1908, Index Cat., Trematoda, Bull. 37, Hyg. Lab., U. S. P. H. & M. H. S.

SPECIFIC DIAGNOSIS.—*Homalogaster* (p. 23): Something over 12 mm. long; form lanceolate; anterior cephalic portion very pointed, 11 mm. long by 6 mm. in maximum breadth; caudal portion much shorter, 3 mm. in maximum breadth. Genital pore on center of a papilla 1.5 mm. from very small terminal mouth. Venter with alternating longitudinal rows of large papillæ extending from about 3 mm. from oral margin to acetabulum. Acetabulum 2 mm. in diameter. Oral papillæ are not reported. Esophagus bifurcates 3 mm. from mouth; intestinal ceca extend to end of anterior portion of body.

Male organs: Testicles small, placed obliquely in cephalic half of body between ceca; one slightly to the right of the median line and 4 mm. from oral margin; the other 2 mm. further caudad, slightly to the left of the median line.

Female organs: Ovary 9.5 mm. from oral margin; vitellogene glands ramified, along the sides of body; uterus almost without coils. Excretory pore dorsal, 12 mm. from mouth; excretory vesicle with 2 lateral lobes.—Based on Poirier, 1883, 74–76.

HABITAT.—In cecum of "*Palonia frontalis*," from Java.

HOMALOGASTER POIRIERI Giard and Billet, 1892.

1892: *Homalogaster poirieri* Giard and Billet, 1892a, 615 (large intestine of cattle; Tonkin).—For bibliography see Stiles and Hassall, 1908, Index Cat., Trematoda, Bull. 37, Hyg. Lab., U. S. P. H. & M. H. S.

SPECIFIC DIAGNOSIS.—*Homalogaster* (p. 23): Size not given. Mouth with slender digitate papillæ. Genital pore caudad of intestinal bifurcation, on elevated papilla, visible to naked eye, a little behind pharynx. Acetabulum very large. Pharynx followed by 2 long simple ceca, which extend in almost a straight line to nearly the latitude of acetabulum (?? indicating absence of esophagus). Vasa deferentia (?efferentia) short, thick, tortuous; testicles lat-

eral (apparently meaning on same transverse plane), divided into 2 large equal lobes with sinuous margins, thus giving the appearance of 4 testicles occupying the corners of a square. Uterus with numerous slings, crowded together, and crowded with eggs in different stages of development; vitellaria lateral of intestinal ceca, with grapelike follicles; vitelline canals unite in posterior part of body, above (cephalad? or dorsad? of) acetabulum in the open space; ovary and shell gland near median line.—Based on Giard and Billet, 1892a, 615.

HABITAT.—Attached to mucosa of large intestine of cattle *Bos taurus?* or *B. taurus indicus?* at Tonkin.

Giard and Billet do not describe the form of the body, but state that it is different from that of *H. paloniæ*.

HOMALOGASTER PHILIPPINENSIS new species.

(Figs. 29 to 44.)

SPECIFIC DIAGNOSIS.—*Homalogaster* (p. 23): Body 7.5 to 9 mm. long by 4.5 to 5 mm. (or flattened to 7 mm.) broad, canoe shaped, cephalic extremity attenuated, caudal extremity rounded; when flattened, sides very convex; dorsum may show submedian longitudinal depressions. Genital pore 1 mm. from oral margin (about one-ninth to one-seventh of body length from mouth, and about at equator of esophagus) surrounded by depressed circular area bearing numerous small papillæ. Venter with alternating longitudinal rows of large papillæ extending from about 2 or 2.5 mm. from oral margin to acetabulum. Margins curved ventrally and are fairly sharp. Acetabulum about 2.5 by 2.7 to 3 mm. Esophagus extends to about one-fifth of body length from oral margin; intestinal ceca narrow, slightly tortuous, long, extending to acetabulum.

Male organs: Testicles lobate, in cephalic half of space between ceca; one caudad of the other; vesicula seminalis quite compactly coiled; pars muscularis distinctly but not highly developed; pars prostatica not prominent, may enlarge to quite a large diameter, thus resembling a "vesicula seminalis interna;" ductus ejaculatorius present; cirrus absent.

Female organs: Ovary and shell gland submedian, near end of one of the ceca, ovary cephalad of shell gland; vitellaria extend about from the bifurcation of esophagus to caudal plane of ovary; uterus with many coils, well developed, passes cephalad, dorsally of testicles, ventrally between vasa efferentia, ventrally of vas deferens, to pore; Laurer's canal opens dorsomedian at plane of termination of ceca. Genital papilla, when extruded, resembles human penis with glans; bears on its vertex a pore, from which runs the short ductus hermaphroditicus; when retracted the papilla resembles a partially inclosed cirrus pouch. Egg oval, operculated, with small knob at opposite pole; 125 to 139μ by 67.5 to 86μ.

Excretory pore dorsomedian about at equator of acetabulum.

HABITAT.—Cecum of *Bos* ———, at Manila, P. I. (type locality), and Phrapatoom, Siam.

TYPE.—U. S. P. H. & M. H. S. 9580 (mounted); Cotypes 9581 and 9960.

Source of material.—This species has been sent to us on two occasions by Dr. Paul G. Woolley. The first specimens (U. S. P. H. & M. H. S. Nos. 9580 and 9581) were collected in 1904 from the cecum of two calves (*Bos* ———) at Manila, P. I.; the second sending (U.

S. P. H. & M. H. S. No. 9960) was collected from the small intestine of a cow (*Bos* ———), Sept. 28, 1906, at Phrapatoom, Siam. No difference has been noticed between the Philippine and the Siam specimens.

EXTERNAL CHARACTERS.

SIZE.—The specimens vary from 7.5 to 9.5 mm. in length, and from 4.5 to 5 mm. in maximum breadth; may flatten under pressure to 7 mm. broad.

COLOR.—Alcohol specimens are of a grayish buff color.

FORM.—In form the fixed specimens are canoe shaped with an attenuated oral and a rounded caudal extremity. The body is divisible into a posterior somewhat cylindrical portion, forming about one-fourth of the total length and an anterior somewhat lancet-shaped portion forming the remaining three-fourths. The posterior cylindrical portion is slightly flattened on its ventral aspect on which it bears the aperture of the acetabulum. The anterior three-fourths of the body is arched dorsally and excavated ventrally. The dorsum may show two longitudinal depressions just mediad of the intestinal ceca. In some of the specimens the lateral margins have curled ventrad in a scroll-like fashion, but it is possible to flatten the specimens without breaking the margins.

SURFACE.—The surface of the rounded posterior portion is smooth; that of the anterior portion is smooth dorsally (without spines or papillæ), but ventrally it is provided with two sets of dissimilar papillæ. One of these sets consists of numerous small papillæ covering a circumscribed, slightly depressed area around the base of the genital papilla; when the genital papilla is not extruded, the genital pore is still in the center of a mammalike elevation (fig. 41), which is much larger than the circumgenital papillæ just mentioned, and which is separated (in sagittal sections) about 1 mm. from the oral margin. The other set of papillæ consists of large and quite prominent elevations arranged in parallel longitudinal rows, extending from about 2 to 2.5 mm. from the oral margin to the rounded caudal portion of the body; laterally they do not attain quite the margins of the body; the papillæ near the median line are the largest, those near the lateral margins are smaller; further, the most anterior and the most posterior of the papillæ incline to a smaller size; in their arrangement the papillæ of any given longitudinal row are situated more or less regularly to correspond to the spaces between the papillæ of the next longitudinal row; as a result, they appear not only in longitudinal, but also in diagonal rows.

The venter and dorsum meet laterally in fairly sharp margins.

Genital pore.—As indicated above, the genital pore (figs. 31 and 41) is ventromedian about 1 mm. from the oral margin, namely,

about one-ninth to one-seventh of the length of the worm from the oral margin.

Acetabulum.—Measurements of the acetabulum taken from press preparations make it about 2.6 mm. in longitudinal diameter by 2.75 to 3 mm. in transverse diameter. The aperture is rather oval in outline, about 1.55 mm. in transverse by 1 mm. in longitudinal diameter.

INTERNAL ANATOMY.

DIGESTIVE TRACT.—The anterior bluntly pointed, attenuated extremity (cephalic cone) is pierced by the mouth, which is not provided with a true sucker. The oral margin is surrounded by a number of slender, digitate papillæ. The mouth gives entrance to a muscular pharynx; the lumen of the latter is at first more or less circular in transverse section, but it rapidly becomes flattened and crescentic with the convexity of the crescent dorsad. From the horns of this crescent spring two lateral pouches and the lumen of the pharynx terminates blindly as a narrow crescentic slit connecting the two lateral pouches. From the ventral aspect and a little above the blind, slitlike termination of the lumen of the pharynx, the esophagus rises and passes caudad, forming a ventral curve in its course. At its point of origin it communicates laterally with the lumen of the pharyngeal pouches, between and a little ventrad of which it lies. The relation of the esophagus to the pharyngeal pouches and blind slit will be seen by reference to figures 32 to 36.

At about one-fifth of the total body length from the oral margin of the worm, the esophagus divides into two simple cecal tubes which pass at first laterocaudad, then in slightly tortuous line caudad to about the level of the cephalic margin of the acetabulum. Just before reaching their termination they shift a little toward the median line. One tube may be somewhat longer, and so terminate at a slightly lower level (more distal) than the other. In their course they are wavy and are separated by a distance about equal to that which separates them from the corresponding lateral margins of the worm. The pharynx, pharyngeal pouches, and esophagus are lined by a cuticle in anatomical continuation with that of the surface. At the esophageal fork this lining abruptly ceases, the intestinal tubes being lined by a nucleated epithelium.

GENITAL SYSTEM.—*Male organs:* The two testicles lie in the cephalic half of the area included between the intestinal ceca, and are somewhat nearer the dorsal than the ventral surface. (Fig. 31.) One is directly caudad of the other, the two being separated by a narrow interval which is partially occupied by some coils of the uterus. The anterior testicle is somewhat smaller than the posterior and in press preparations their outlines are sinuous. but sections

show them to be so markedly indented as to amount to a very distinct lobation. A vas efferens rises from each testicle; that from the posterior testicle appears to spring from the right dorsolateral aspect and passes cephalad between the anterior testicle and the right intestinal cecum; that from the anterior testicle springs from near the left margin of its cephalic aspect, and passing cephalad, it unites with its fellow beneath the esophageal fork to form the vas deferens. In their course they both become dilated and contain masses of spermatozoa. The vas deferens winds its way cephaloventrad in close relation with the coils of the uterus, and opens to the exterior by a pore common with the opening of the female duct. During its course, several distinct portions may be more or less clearly recognized, but not with equal ease in all specimens. Most favorable for interpretation seem to be specimens with fully extruded, mushroom-like genital papilla. The centripetal portion of the vas represents the vesicula seminalis, which is coiled up into a more or less compact mass and which, when filled with spermatozoa, may present quite a large lumen. Next, centrifugally, comes the pars muscularis; this is provided with distinct muscular fibers, but is not developed to such an extent as seen in certain other amphistomes, for instance in *Paramphistomum calicopharum*. The duct then becomes rather suddenly enlarged, is surrounded by a less prominent layer of muscular tissue, is provided with a considerable number of cells resembling those found in the pars prostatica of other amphistomes, but much less striking in their development and arrangement, so that were it not for analogy, one would probably hesitate to interpret them as prostatic cells; the lumen of this portion may contain large masses of spermatozoa, so that in general effect the structure reminds the observer of the vesicula seminalis interna described for certain species possessing a cirrus pouch. As this portion narrows centrifugally, the prostatic-like cells at first seem to increase, then to decrease in number, until they finally disappear. Then follows a portion of the male canal, of narrower diameter, but still remaining larger than the corresponding portion of the female duct, and apparently devoid of both muscles and prostatic cells; this apparently represents the ductus ejaculatorius and opens into such a short ductus hermaphroditicus that the latter almost represents only a pore common to the male and the female canals.

Female organs: Caudad of the testicles, the interspace between the intestinal ceca contains coils of the uterus, the ovary, and the shell gland. The ovary is a somewhat globular body, very much smaller than either testicle; it is placed a little to the left of the median line, near the end of one of the intestinal ceca, and somewhat above (cephalad of) the anterior margin of the acetabulum. From its dorsoinferior (caudal) aspect springs the oviduct which curves cau-

dad to enter the shell gland; the latter is immediately beneath (caudad of) the ovary. In the shell gland the oviduct unites with the vitelloduct. Just before entering the shell gland the oviduct receives Laurer's canal, from which point the latter passes centrodorsad to open in the median line on the dorsal surface about on the transverse plane of the termination of the intestinal ceca.

From the ventral aspect of the shell gland and appearing like a continuation of a spindle shaped dilatation (ootyp) of the canal formed by the vitello- and oviduct there emerges the uterus which at once forms numerous coils. In its course cephalad the uterus passes dorsad of the testicles; a loop of it is tucked into the narrow interspace between the two testicles. Cephalad of the anterior testicle it winds its way ventrad to the genital pore, passing caudad of the arch formed by the union of the two vasa efferentia, and remaining in close relation to the ventral aspect of the male canal.

In its course the uterus contains numerous eggs and near its point of emergence from the shell gland some of the eggs are intermingled with a mass of spermatozoa.

The vitellogene glands lie in the lateral areas, beginning at the level of the esophageal fork and extending to a plane slightly caudad of the ovary. These vitellaria are composed of scattered irregularly globular follicles confined to the inner half of these areas. Somewhat above (cephalad of) the level of the ovary the main right and left vitelloducts originate and pass mediad and slightly caudad in front (ventrally) of the intestinal tubes, to unite and form a common duct which curves around the caudal aspect of the shell gland, which it pierces to unite with the oviduct.

Genital pore.—The genital pore is situated at a point about midway from the oral margin to the esophageal fork, namely, about one-ninth to one-seventh of the body length from the oral margin. It is at the summit of a very peculiar genital papilla, which is easily subject to misinterpretation because of its different appearance in different specimens, due to the greater or less condition of extrusion or retraction. Sections with fully extruded papilla (figs. 31 and 37) form the best basis for study. When fully extruded, this papilla resembles somewhat the human penis with its glans. There is a distinctly swollen terminal portion 0.4 mm. in diameter, and 0.2 mm. long; this is followed centripetally by a constricted peduncle about 0.25 mm. in diameter and 0.15 mm. in length; its surface is smooth. At its vertex is situated the genital pore (opening of the ductus hermaphroditicus) from which the genital canals lead centripetally in quite a direct course. The parenchyma of this papilla is composed chiefly of very striking, large cells, provided with disproportionately small nuclei.

When the bulbous portion of this papilla is retracted (fig. 41) the large parenchymatic cells assume a rather deep position and might easily be interpreted as glandular cells; further, the retracting muscles arrange themselves in such a way as to give to the structure a remarkable resemblance to a partially formed cirrus pouch such as is described by Looss (1896b, p. 28, fig. 14) for *Gastrodiscus ægyptiacus*.

EGG.—The uterine egg (fig. 44) is oval in form and white in color by reflected light under a low power. With a slightly higher magnification by transmitted light it is seen to contain a dark, granular mass, with a circular area, somewhat eccentrically placed; this appears almost free of these dark granules; with still higher magnification it is noted that the eggshell is rather thin in the equatorial zone, but slightly thicker at the poles. At one pole the shell is provided with a small operculum; at the other pole, which at first appears to be somewhat less blunt, but which in reality is slightly more so, there is a small knob. The contents of the egg are inclosed in a membrane which with a high magnification does not appear to be in direct contact with the shell. The average measurements of 27 eggs were 132.2 μ in length, by 74.5 μ in width; the extremes were 125 μ and 139 μ in length and 67.5 μ and 86 μ in breadth.

EXCRETORY SYSTEM.—The excretory vesicle is situated dorsad of the acetabulum in the caudal rounded portion of the body. A little caudad of the cecal ends of the intestinal tubes it receives two large lateral excretory canals, which can be traced some distance cephalad. From the vesicle a canal passes caudodorsad to open in the median line of the dorsum about at the level of the center of the acetabulum. The canal is lined by a cuticle in anatomical continuation with that of the surface.

AGAMODISTOMUM NANUS new species.

(Figs. 45 to 66.)

SPECIFIC DIAGNOSIS.—*Agamodistomum:* Minute distomes 0.35 to 0.412 mm. long, 0.246 to 0.27 mm. broad, 0.147 mm. thick; oval, venter flat, dorsum convex, cephalic and caudal margins bluntly rounded, lateral margins convex. Apparently without spines. Oral sucker subterminal, 32 μ. Acetabulum slightly larger, 41 to 46 μ, in equatorial plane of body. Genital pore median, about midway between acetabulum and caudal margin (compare *Clinostomum*). Pharynx apparently present; postpharyngeal esophagus very short or wanting; bifurcation 92 μ from center of mouth; ceca fusiform extending beyond genital pore, may extend nearly to caudal margin. Primordium of cirrus pouch (?) large and prominent, extending nearly straight dorsad, between ceca; one genital primordium dorsocaudad of this, another caudad, near caudal margin. Excretory pore dorsosubterminal; primordium of excretory vesicle present; at least two excretory canals present.

HABITAT.—Encysted in pectoral muscle of African partridge (*Francolinus subtorquatus*) at Benguella, West Africa.

TYPE.—U. S. P. H. & M. H. S., No. 9834, two worms mounted in toto on one slide; cotypes in sections. Alcohol material in U. S. National Museum and in collection of American Society of Tropical Medicine.

SOURCE OF MATERIAL.—A bottle of material collected by Doctor Wellman in Benguella, West Africa, and sent to us for determination, contained portions of the "pectoral muscles of a partridge, *Francolinus subtorquatus*." The muscles are beset with a number of small cysts, about 1.0 mm. long, which bear a superficial resemblance to the sarcosporidia occasionally found in birds. Upon careful teasing, as well as upon section, the cysts are seen to contain minute agamic distomes, apparently one parasite in each cyst.

SIGNIFICANCE OF INFECTION FROM STANDPOINT OF FOOD INSPECTION.—As will be seen from the following account of the anatomy, this parasite does not correspond to any species thus far known to occur in man. Whether it would develop in man further if taken in the food can not be stated at present. From the standpoint of food inspection the infection would for the present be similar to a severe infection with sarcosporidia, namely, an infection not dangerous to man, but one which so altered the condition of the meat as to lead to its condemnation.

At the present moment this infection is not known for partridges in the United States.

EXTERNAL CHARACTERS.

MEASUREMENTS.—The parasites vary in size, attaining 0.352 to 0.416 mm. in length by 0.246 to 0.272 mm. in transverse diameter, and 0.147 mm. in dorsoventral diameter.

COLOR.—The unstained alcoholic specimens are of a yellowish gray color, with two longitudinal lighter fusiform spots, due to the intestinal ceca. In transmitted light the worm has the appearance of a small amount of foam, this foamy appearance being due to the cellular structure.

FORM.—The worms are oval in outline, with flat venter and convex dorsum; the oral (cephalic) and aboral (caudal) margins are bluntly rounded and of nearly the same form; the lateral longitudinal margins are convex.

SURFACE.—No spines could be distinguished on the cuticle.

ORAL SUCKER.—The oral sucker is ventrosubterminal, 32.2 μ in diameter, and directed from dorsocaudal to ventrocephalad.

VENTRAL ACETABULUM.—The ventral acetabulum may be exactly in the equatorial plane, or slightly caudad of equator; it is 41 to 46 μ in diameter, with a circular aperture of 13.8 μ; on section it is 38.8 μ in dorsoventral diameter.

GENITAL PORE.—Halfway between the acetabulum and the caudal

margin, or slightly nearer the acetabulum, is situated the genital pore, which is rather prominent and is surrounded by darkly staining tissue.

EXCRETORY PORE.—The excretory pore is dorsoterminal.

INTERNAL ANATOMY.

DIGESTIVE TRACT.—The digestive tract is the most prominently developed organ system in this stage of development. Through its entire extent its lumen is entirely occupied by a gelatinous or (?) granular mass, in which cellular structure is not distinguishable.

Extending dorsocaudad from the oral sucker the esophagus may be distinguished; at the point where the esophagus leaves this sucker there is a bulbous structure, the wall of which is composed of a single row of nucleated cells; the impression gained is that this is a pharynx in process of development. The bifurcation (into two intestinal ceca) occurs about 56 μ caudad of the center of the oral sucker, so that the postpharyngeal portion of the esophagus, though distinct, is exceedingly short. In their course caudad the intestinal ceca diverge from the median line and at first, for a distance of about 92 μ, increase gradually in diameter; then they increase rapidly in diameter, but upon nearing the region of the genital pore they again decrease, each ending in a rather sharp point somewhat caudad of the pore; in some cases they extend to a plane about halfway between the genital pore and the caudal end of the body. In transverse section the ceca are nearly circular, but the dorsoventral diameter is slightly greater than the transverse diameter (88 to 76 μ in one case). Thus the ceca represent the two fusiform spots seen in the unstained specimen.

In the wall of the ceca may be seen a few very small nuclei.

The ceca are somewhat nearer the dorsum than the venter.

GENITAL SYSTEM.—The primordium of the genital system is present, but the arrangement of the sexual glands can not be analyzed. On section a distinct canal is seen to run almost directly dorsad, but slightly caudad, between the intestinal ceca; in one section this canal had the appearance of dividing into two canals, a male and a female duct, but this point can not be asserted without reserve. The canal is surrounded by a mass of darkly staining tissue, about 69 μ long (i. e., dorsoventrad in reference to the worm) by 46 μ broad (cephalocaudad in reference to the worm); the entire structure gives the impression of being a cirrus pouch in course of development.

Dorsocaudad of this structure is a second, much smaller, darkly staining mass of cells, and still further caudad, near the caudal margin of the worm, is still a third darkly staining mass.

EXCRETORY SYSTEM.—At the caudal end, slightly dorsad, is an invagination, surrounded by a row of cells, and apparently representing the excretory vesicle. Excretory canals are also visible on section.

SYSTEMATIC POSITION.—From the foregoing account it will be seen that this worm is an agamic distome with genital pore about midway between the acetabulum and the caudal margin (compare for instance *Clinostomum*).

A REEXAMINATION OF THE ORIGINAL SPECIMEN OF TÆNIA SAGINATA ABIETINA (WEINLAND, 1858).

By CH. WARDELL STILES, Ph. D.,
Chief of Division of Zoology,
and
JOSEPH GOLDBERGER, M. D.,
Passed Assistant Surgeon, Hygienic Labratory, U. S. Public Health and Marine-Hospital Service.

Since 1858 works on zoology and on the practice of medicine make mention of a tapeworm which Weinland described as *Tænia solium* var. *abietina*. Opinions of authors have differed in regard to the exact status of the parasite in question, some writers considering that it represented a distinct species, others that it was a variety of *Tænia solium*, and still others, that it was a peculiar specimen of *Tænia saginata*.

In a recent visit to Boston one of us found the original specimen, or rather all that seems to be left of it, in the Warren Anatomical Museum, and through the courtesy of Doctor Whitney, curator of the museum, we have been able to reexamine this interesting material. In connection with a brief account of our rather unsatisfactory results it may be well to give a review of the history of the parasite in question, which now bears the U. S. P. H. & M. H. S. No. 9713, but which will be returned to the Warren Museum.

SYNONYMY.

1858: *Tænia solium* var. *abietina* Weinland, 1858, 43–45, 84; 1861, 4–5, 12–14, pl. 5, figs. 18–20.
—— as variety of *Tænia mediocanellata* in Leuckart, 1863, 289, fig. 80 (based upon reexamination of original material).—Diesing, 1864a, 369.
—— as variety of *T. saginata* in Leuckart, 1880, 605–606, fig. 272.—Blanchard, 1886a, 362–363, fig. 238.
—— as syn. of *T. saginata* in Braun, 1903, 3 ed., 224.
—— as possible syn. of *T. confusa* in Braun, 1903, 3 ed., 229.
—— as doubtful syn. of *T. saginata* in Stiles, 1898a, 72.
1864: *Tænia mediocanellata* var. *abietina* (Weinland, 1858) Diesing, 1864a, 369.
1873: *Tænia abietina* (Weinland, 1858) Davaine, 1873a, 572; 1877a, 1, 909, 910, 920.—Cobbold, 18—, —. —Swart, 1862, 18.
—— as doubtful syn. of *T. saginata* in Stiles, 1898a, 72.

1880: *Tænia saginata* var. *abietina* (Weinland, 1858) Leuckart, 1880, 605–606 fig. 272.—Stiles, 1906, June, 31–32, figs. 35–38.

1885: *Tænia abietina* (Weinland, 1858) Guzzardi Osmundo, 1885a, 580.

HISTORICAL REVIEW: Weinland's (1858, 43–45, 84) original account of this species is as follows:

[p. 43] § 63. Under this name [*Tænia solium* var. *abietina*] I will introduce a specimen of tapeworm which comes from a Chippewa Indian, at the Sault Ste. Marie, Lake Superior; it was obtained there by Professor Agassiz during his famous trip to that lake. The specimen consists of a chain [p. 44] of several feet in length, from the mature part of the worm. The head, neck, and the whole anterior half are wanting.

The most striking thing in this worm is its extreme narrowness and meagerness, while *Tænia mediocanellata*, which it resembles in the configuration of the uterus, is very broad and thick, according to Kuechenmeister. A figure of this worm, of its uterus and eggs, we intend to publish in our work on the parasites of man.

All the joints which are preserved are very thin, nearly transparent, and equally narrow, their transverse diameter being about 4 mm., and the longitudinal about 12 mm. The genital openings are very small, and without external lips; this may be owing to the very mature age of the joints in question. There is no pigment in either vagina or spermatic duct. The uterus is more regular than either in *Tænia solium* or in *Tænia mediocanellata*, yet it more resembles the latter. The middle trunk of the uterus is quite straight; the branches, about 30 in number, start from the main stem, either at right angles or at an angle of about 45°. These branches are always quite parallel, and are generally straight; but whenever they are bent, all make the same angle; they are never arborescently divided, nor furcated at the ends, with the exception of the foremost and the hindmost in each joint, which run, the former forwards, the latter backwards, both being forked and crooked. The eggs, which are extremely plenty in these joints, and which show the whole configuration of the uterus in a yellowish tint to the naked eye, are 0.033 mm. long, and 0.030 mm. broad; they are protected, first, by an outside shell (chorion) which is 0.003 mm. thick, dark in its outer layers, transparent, yellowish inwards; then follows a second shell (yolk membrane), 0.0006 mm. thick, entirely transparent. In the cavity of the egg lies the embryo, occupying about two-thirds of it, and measuring only 0.016 mm. We saw other eggs, unripe, and with one eggshell only, but very rarely.

We consider this worm merely as a variety of *Tænia solium*, and we called it varietas *abietina*, from abies, a pine tree, which the configuration of its uterus resembles.

We hope soon to get more information concerning this Indian tapeworm from our western and Canadian medical friends.

[p. 84] 2b. *Tænia solium*, L. Varietas *abietina* Weinland.

Obtained by Prof. L. Agassiz from a North American (Chippewa) Indian, at Lake Superior. The specimen is preserved in the Zoological Museum, Cambridge, Mass.

Later, Weinland (1861, 4–5, 12–14, pl. 5, figs. 18–20) reverts to this subject; his account of the parasite is practically a translation of the paragraph quoted above, but he adds that the worm was collected in 1850; the eggs measure 33 by 30 to 33 μ; the chorion is dark brown externally, lighter internally. Weinland was unable to recognize any further details.

So far as we have been able to find, Leuckart (1863, 289, fig. 80) is the only other helminthologist who has examined this parasite; he reexamined part of Weinland's original material and concluded that it represented a variety of *Tænia mediocanellata;* in his later work (1880, 605–606, fig. 272) he refers to it as *Tænia saginata* var. *abietina.* Not altogether in harmony with Weinland's description, Leuckart's figure of the uterus shows a number of the lateral pouches of the uterus as branched; he gives about 40 branches each side.

All later references to the parasite are either based directly upon the conclusions drawn by Weinland and by Leuckart, or are opinions expressed on basis of the data given by these two authors.

Diesing (1864a, 369) considers *abietina* a variety of *T. saginata.*

Blanchard (1886a, 362–363, fig. 238) considers it as "a simple variety of *T. saginata.*"

Braun (1903, 3 ed., 224) thinks it a "*T. saginata,* with uterine branches somewhat more thickly set;" he also suggests (p. 229) that it may possibly be identical with *T. confusa* Ward.

Stiles (1906, June, 31–32, figs. 35–38) recognized the form provisionally as a subspecies of *Tænia saginata.* He republished Weinland's and Leuckart's illustrations of the worm.

REEXAMINATION OF ORIGINAL MATERIAL.—*Segments:* The specimen consists of only 5 gravid segments, which are in very poor state of preservation. At the time it came into our hands it was completely dried out and, naturally, brittle. It was soaked in very weak alcohol, which was gradually increased in strength; then it was transferred to alcohol glycerin, the alcohol was allowed to evaporate, and the worm eventually mounted in glycerin jelly. Because of its having been dried a detailed study of the anatomy is of course excluded.

The segments measure as follows:

About 12 mm. long by about 2 mm. broad.
About 12 mm. long by about 2 to 3 mm. broad.
About 12 mm. long by about 2 to 2.5 mm. broad.
About 11 mm. long by about 2.5 mm. broad.
About 11 mm. long by about 2.5 to 3.5 mm. broad.

Genital pores.—The genital pores are irregularly alternate and are caudad of the equator of the segment—more exactly, about five-eighths from the anterior margin.

Uterus.—No remnants of the genital glands can be seen, and it is scarcely possible to count the lateral branches of the uterus; these are, however, numerous.

Eggs.—The uterus is crowded with eggs, which vary in size from 31 to 37.5 by 30 to 33.9 μ. An average of 31 embryophores gave 36.27 by 32.09 μ; the usual length (21 cases) was 37.5, the most frequent breadth (11 cases) 31.9 μ.

We have obtained or compiled the following measurements for the embryophores of the tænias of man:

T. solium, almost round, 31 to 36 μ.
T. saginata, ovoid, 35 to 40 by 20 to 30 μ.
T. confusa, 39 by 30 μ.
T. africana, 31 to 39 by 33.8 μ.
T. abietina, 31 to 37.5 by 30 to 33.9 μ.

From these measurements it will be seen that the eggs of *T. abietina* do not agree exactly with any of the species mentioned.

Calcareous corpuscles.—The calcareous corpuscles are exceedingly numerous, round to oval in shape, varying considerably in size, and attaining 17.6 μ in diameter. Comparing these with the measurements given for other forms, we have the following table:

Tænia solium, up to 12 μ, sparse.
T. saginata, up to 18 μ, plentiful.
T. confusa, up to 11 μ, sparse.
T. africana, 10.4 by 16.9 μ, sparse.
T. hominis, very numerous.
T. abietina, up to 17.6 μ, very numerous.

The data given above are scarcely sufficient to enable one to express a positive opinion upon the systematic value of *T. abietina*. They seem, however, to be too meager to fully justify its separation from *T. saginata*, and almost too much to fully justify viewing it as a typical *T. saginata*.

Were these fragments sent to us for determination, without knowledge of their origin, we should conclude that they were probably a dwarfed specimen of *Tænia saginata*.

In order to obtain opinions from other persons, we have submitted the fragments to Hassall, Ransom, and Ward, requesting them to come to a conclusion before they inquired into the history of the material. Ward was disinclined to consider the segments as belonging to *T. saginata*, while Hassall and Ransom were both inclined to consider them as belonging to this species.

Under existing circumstances no exact determination can be accepted as final, but four of the five helminthologists who have reexamined the material incline to the *saginata* determination, while one is disinclined.

That the material does not agree exactly with the typical *Tænia saginata*, as we find it in this country, must be admitted, but we do not feel justified at present in recognizing it as of full specific rank.

Under existing circumstances perhaps the best solution of the matter is to accept it as a doubtful subspecies, *Tænia saginata abietina* and call attention to the worm in the hope that some new specimens may be collected which will permit of a definite opinion. We must look to the physicians in the North and West, particularly to those near Sault Ste. Marie, to find such material.

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 4.

FIGS. 1–4.—Four photographs of Gates's patient in Florida, showing acne-like condition and enlarged breasts, due to infection with *Sporotrichum proliferum*. Original; photos kindly furnished by Doctor Gates.

FIG. 5.—*Sparganum proliferum*, in part in a cyst. Original. ×10.

FIG. 6.—*Sparganum proliferum*, escaped from the cyst. Original. ×10.

FIG. 7.

FIGS. 7–15.—Nine specimens of *Sparganum proliferum*, showing various forms, buds, and supernumerary heads. Original. ×10.

FIG. 8.

FIG. 9.

FIG. 10.

FIG. 11.

FIG. 12.

FIG. 13.

FIG. 14.

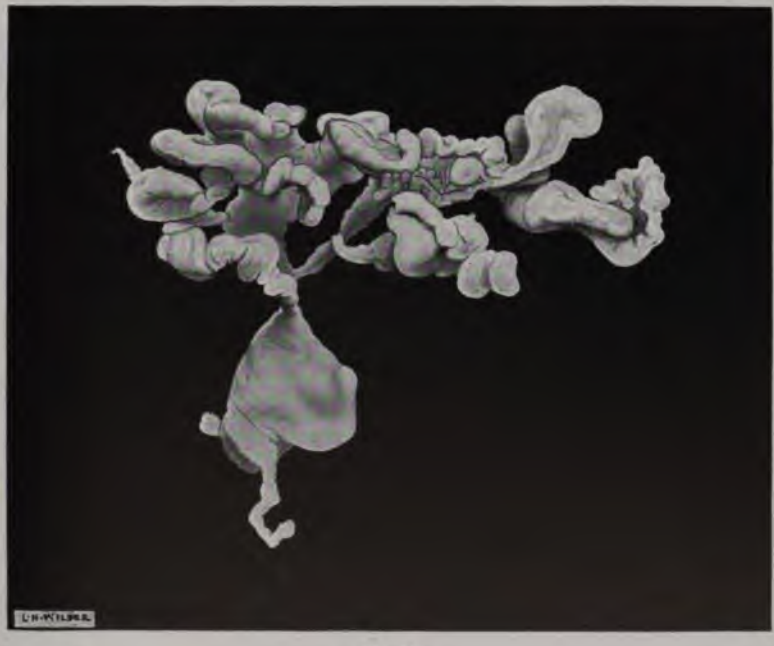


FIG. 15.

FIG. 16.—Section through a cyst (*a*), with the escaped *Sparganum proliferum* (*b*); *x*, reserve food particle. Original.

FIG. 17.—Section through a reserve food particle. (See *x*, fig. 16.) Enlarged. Original.

FIG. 18.—Section showing large excretory canal, smaller canals, calcareous corpuscles, and a pore. Enlarged. Original.

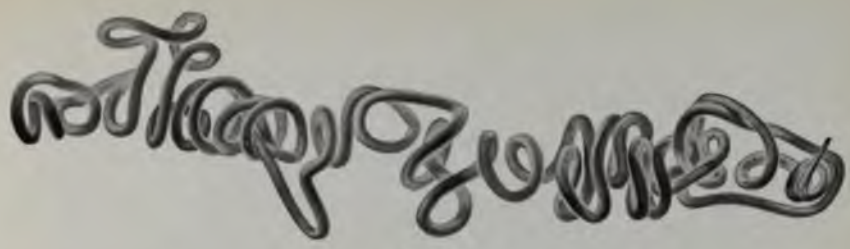


FIG. 21.

FIG. 19.

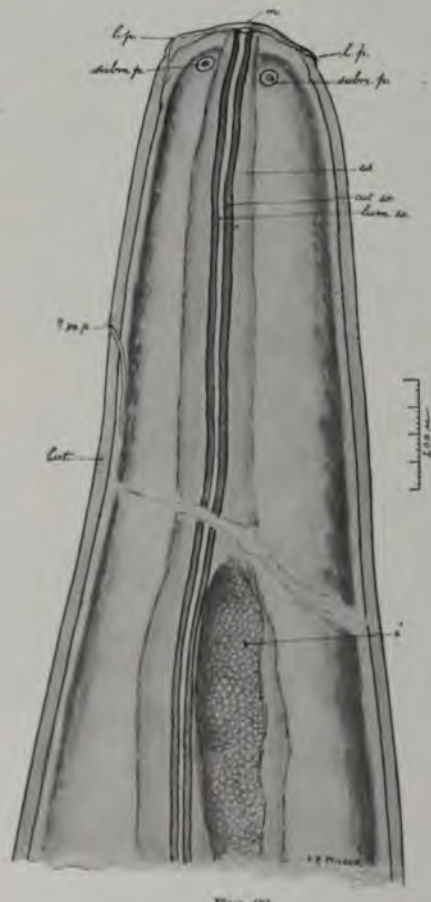


FIG. 22.

FIG. 20.

FIG. 19.—Head of *Filaria restiformis*. Enlarged. Leidy's original figure.

FIG. 20.—Tail of *F. restiformis*. Enlarged. Leidy's original figure.

FIG. 21.—Figure of type specimen of *F. restiformis*. Natural size. Original.

FIG. 22.—Enlarged view of head of same: the body is surrounded by a distinct cuticle (*cut.*); cuticle of esophagus (*cut. es.*); esophagus (*es.*); blind intestinal sac (*i.*); lumen of esophagus (*lum. es.*); a pair of lateral papillæ (*l. p.*) and two submedian papillæ (*subm. p.*) are visible; the mouth is terminal (*m.*). Original.

FIG. 23.

FIG. 24.

FIG. 25.

FIG. 23.—Tail of same; the dark body in the center represents the intestine. Enlarged. Original.
FIG. 24.—Optical section of cuticle showing layers. Greatly enlarged. Original.
FIG. 25.—Diagonal system of fibers of cuticle. Greatly enlarged. Original.

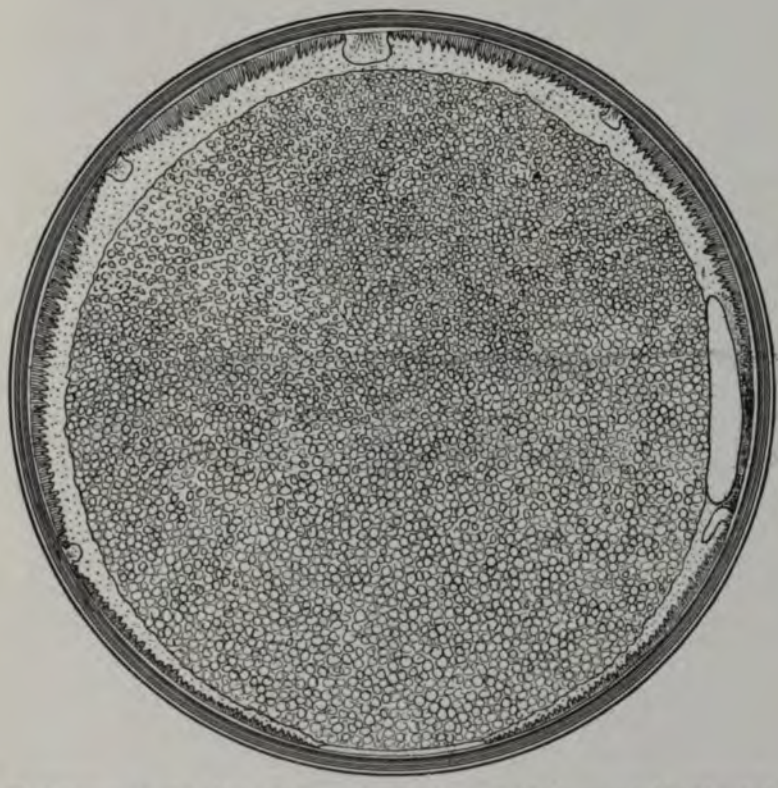


FIG. 26.—Transverse section of type specimen, showing 6 muscular fields, separated by 6 longitudinal lines; the central mass is the fat body. Greatly enlarged. Original.

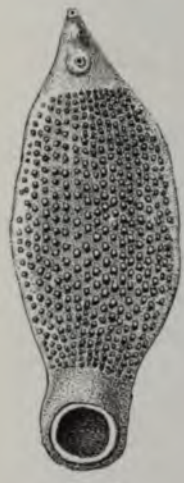
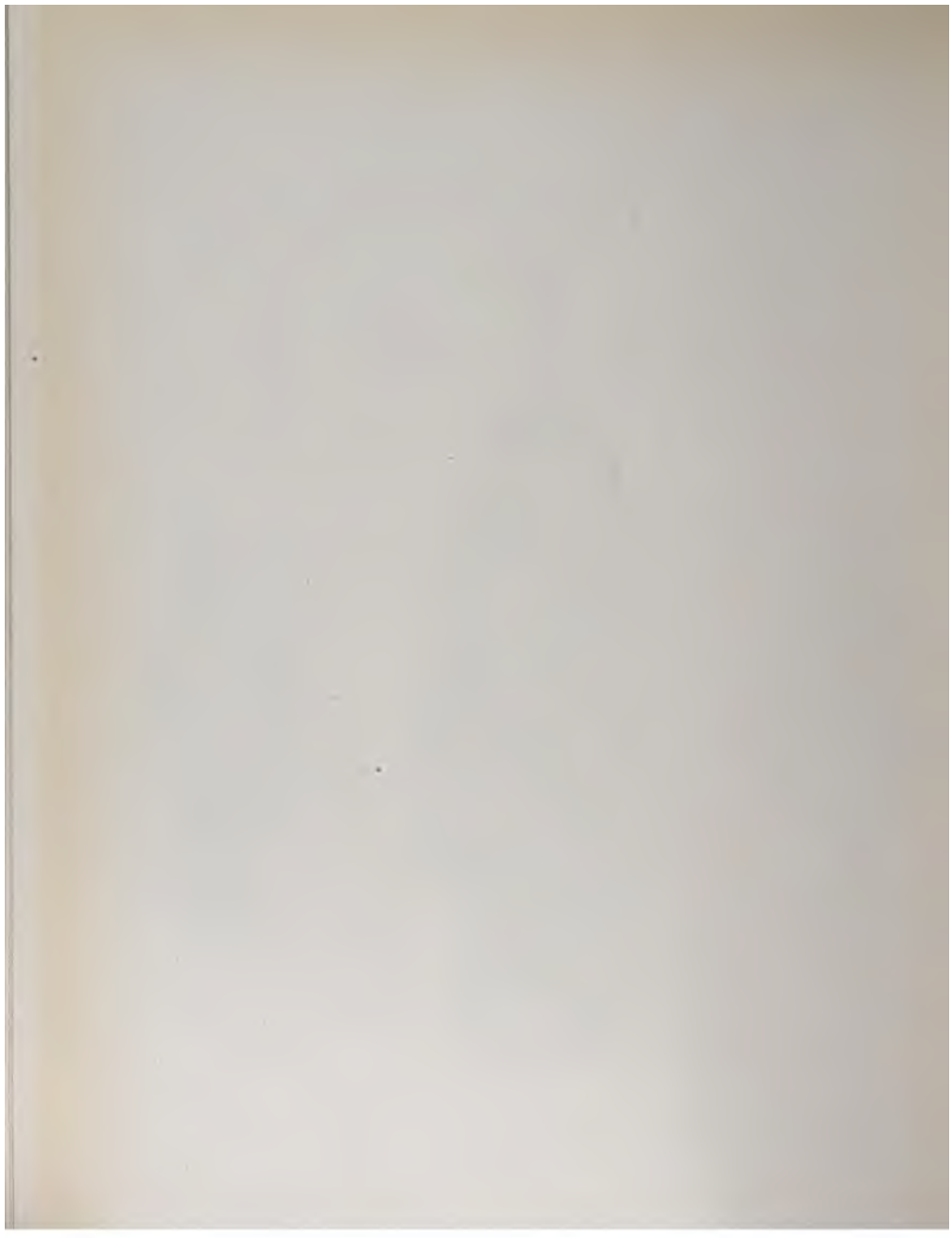


FIG. 27.

FIG. 29.

FIG. 28.

FIGS. 27-28.—*Homalogaster paloniæ*. (After Poirier 1883, figs. 1a-b.)
FIG. 29.—*Homalogaster philippinensis*, ventral view. Enlarged. Original.



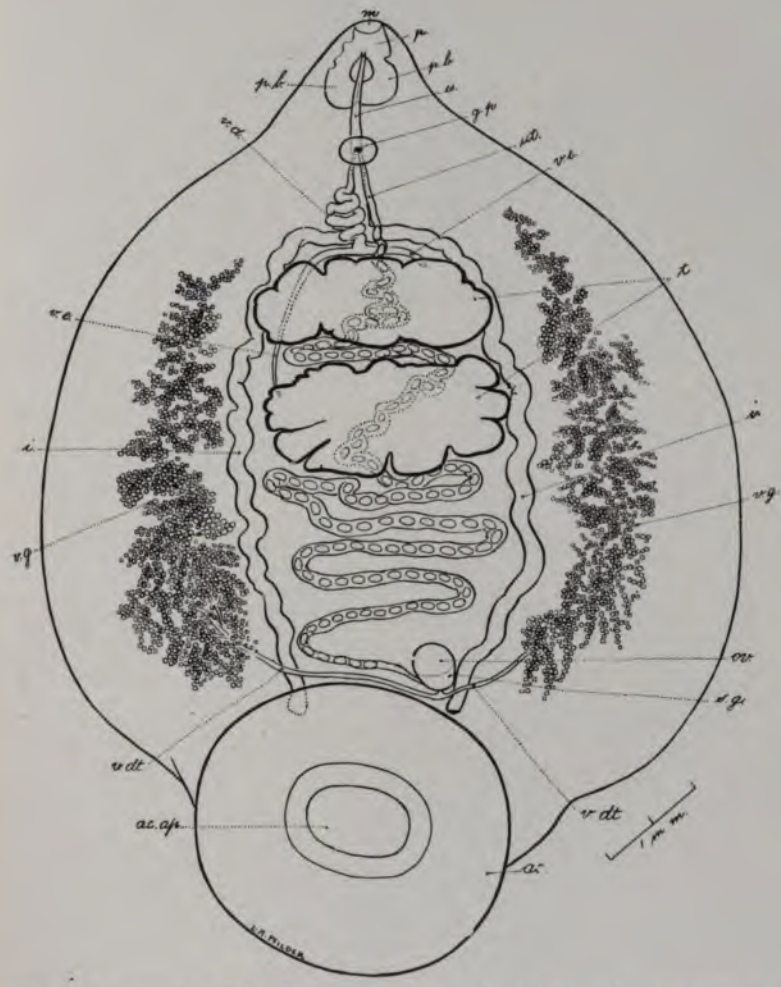


FIG. 30.—Press preparation of *Homalogaster philippinensis*, showing internal anatomy: *ac.*, acetabulum; *ac. ap.*, aperture of acetabulum; *es.*, esophagus; *g. p.*, genital pore; *i.*, intestine; *m.*, mouth; *ov.*, ovary; *p.*, pharnax; *ph. b.*, pharyngeal pouch; *s. g.*, shell gland; *t.*, testicle; *ut.*, uterus; *v. d.*, vas deferens, *v. e.*, vas efferens; *v. g.*, vitellogene gland; *v. dt.*, transverse vitello-duct. Enlarged. Original.

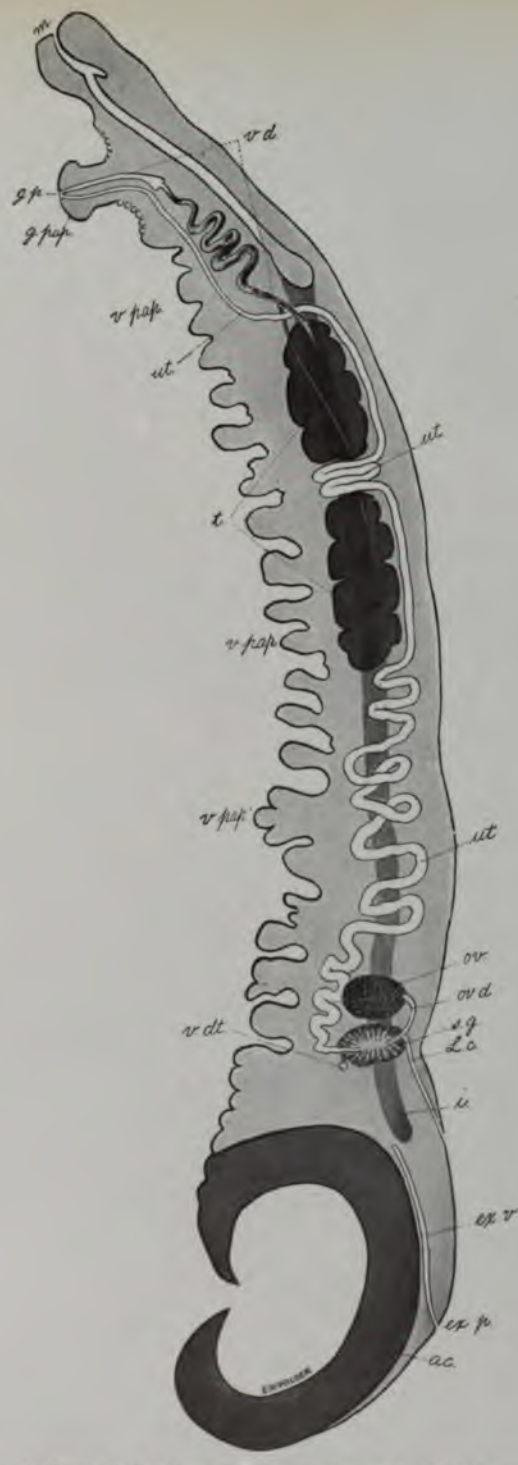


FIG. 31.—Optical, sagittal section showing internal anatomy: *ex. p.*, excretory pore; *ex. v.*, excretory vesicle; *g. pap.*, genital papilla; *L. c.*, Laurer's canal; *ov. d.*, oviduct; *v. p.*, ventral papillæ. Remainder of lettering as in figure 30. Semidiagrammatic. Enlarged. Original.

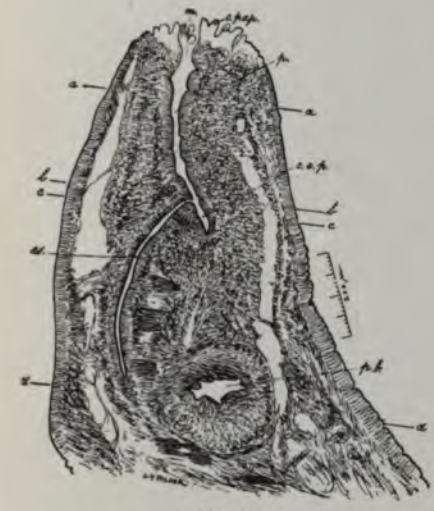


FIG. 32.

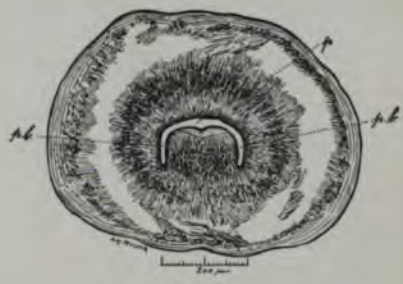


FIG. 34.

FIG. 35.

FIG. 36.

FIG. 33.

FIG. 32.—Sagittal section through oral extremity: *c. e.p.*, cecal extremity of pharynx; *es.*, esophagus; *m.*, mouth; *o. pap.*, oral papillæ; *p.*, lumen of pharynx; *p. b.*, lumen of pharyngeal pouch; *a–a*, *b–b*, *c–c*, *d–d*, planes of section. Enlarged. Original.

FIG. 33.—Transverse section through plane *a–a* of figure 32, showing pharyngeal lumen (*p.*). Enlarged. Original.

FIG. 34.—Transverse section through plane *b–b* of figure 32, showing pharyngeal lumen (*p.*) and aperture of pharyngeal pouches (*p. b.*). Enlarged. Original.

FIG. 35.—Transverse section through plane *c–c* of figure 32, showing cecal extremity of pharynx (*c. e. p.*); beginning of esophagus (*es.*) and aperture of pharyngeal pouches (*p. b.*). Enlarged. Original.

FIG. 36.—Transverse section through plane *d–d* of figure 32, showing relative positions of esophagus (*es.*) and pharyngeal pouches (*p. b.*). Enlarged. Original.

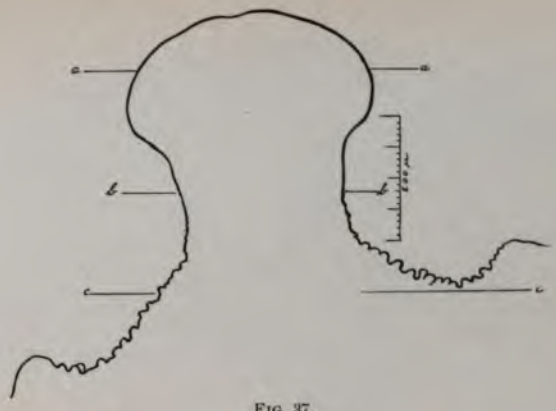


FIG. 37.

FIG. 38.

FIG. 39.

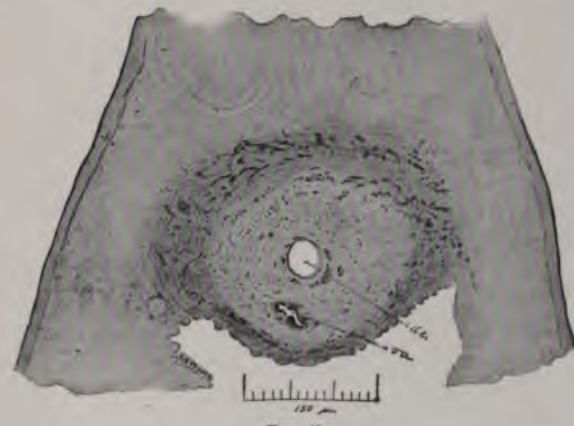


FIG. 40.

FIG. 37.—Outline of genital papilla in sagittal section, showing also the papillæ around the base; *a–a*, *b–b*, *c–c*, planes of section. Enlarged. Original.

FIG. 38.—Section through genital papilla in plane *a–a*, of figure 37. The section is not quite at right angles to the axis of this papilla. It shows the metraterm (va.) and the ductus ejaculatorius (*d. e.*) filled with spermatozoa. Enlarged. Original.

FIG. 39.—Section through genital papilla in plane *b–b* of figure 37. Lettering as figure in 38. Enlarged. Original,

FIG. 40.—Section through genital papilla in plane *c–c* of figure 37. Lettering as in figure 38. Enlarged. Original.

FIG. 41.—Transverse section showing retracted genital papilla (*g. pap.*), esophagus (*es.*) and the papillæ around base of genital papilla. Enlarged. Original.

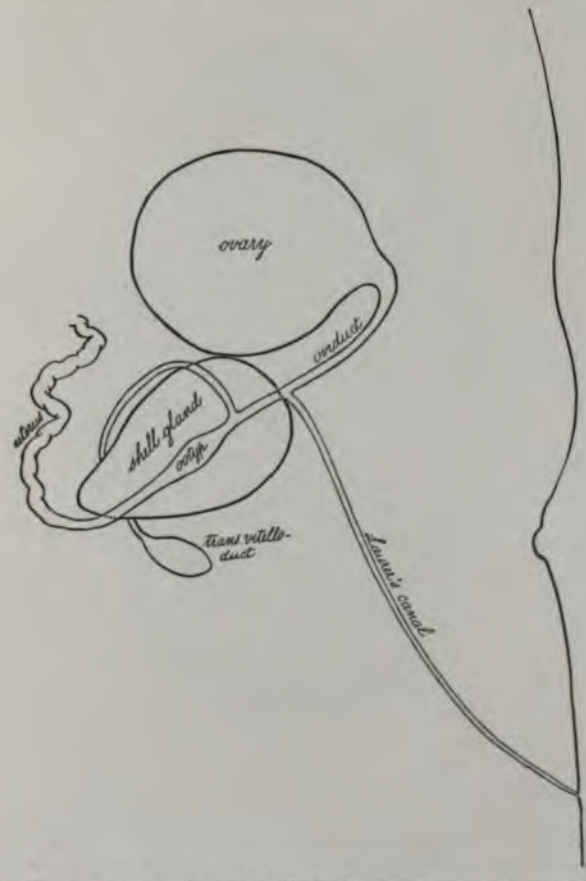


FIG. 42.—Diagram showing relation of ovary, shell gland, oviduct, ootyp, uterus, and Laurer's canal in sagittal plane. Original.

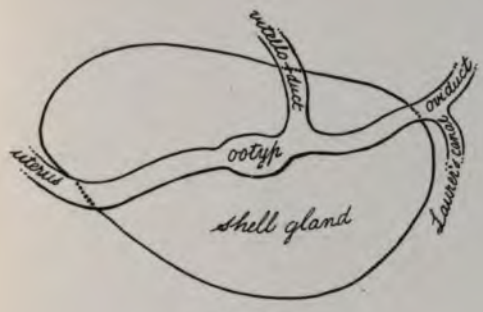


FIG. 43.

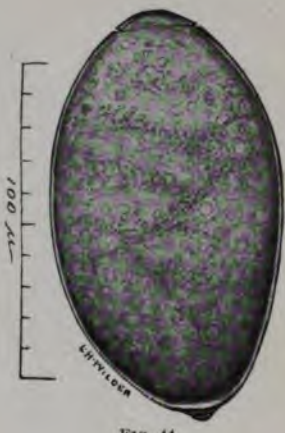


FIG. 44.

FIG. 45.

FIG. 43.—Diagram showing shell gland, ootyp, vitelloduct, uterus and Laurer's canal. Original.
FIG. 44.—Egg. Enlarged. Original.
FIG. 45.—Ventral view of *Agamodistomum nanus; ac.*, acetabulum; *g. p.*, genital pore; *i*, fusiform intestine; *m.*, oral sucker; *par.*, foamy parenchyma; *pr. g.*, primordium of genital glands.

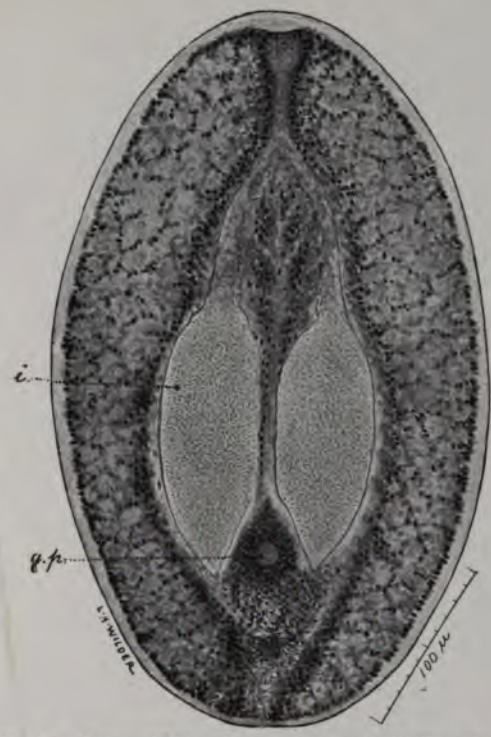


FIG. 46.—Dorsal view of *Agamodistomum nanus*. Lettering as in fig. 45.

FIG. 47.

FIGS. 47–53.—Series of 7 consecutive sagittal sections of cyst with contained parasite, showing anatomy of parasite from its right lateral margin to a plane on the left of the median line. Note the foamlike structure of the parenchyma of the worm, the fusiform intestine (*i.*, 50, 51, 53), the pharynx (*p.*, 51, 52), the acetabulum (*ac.*, 52), ventral genital pore (*g. p.*, 52), genital primordium (*pr. g.*, 52), and the dorsosubterminal excretory pore (*x. p.*, 52).

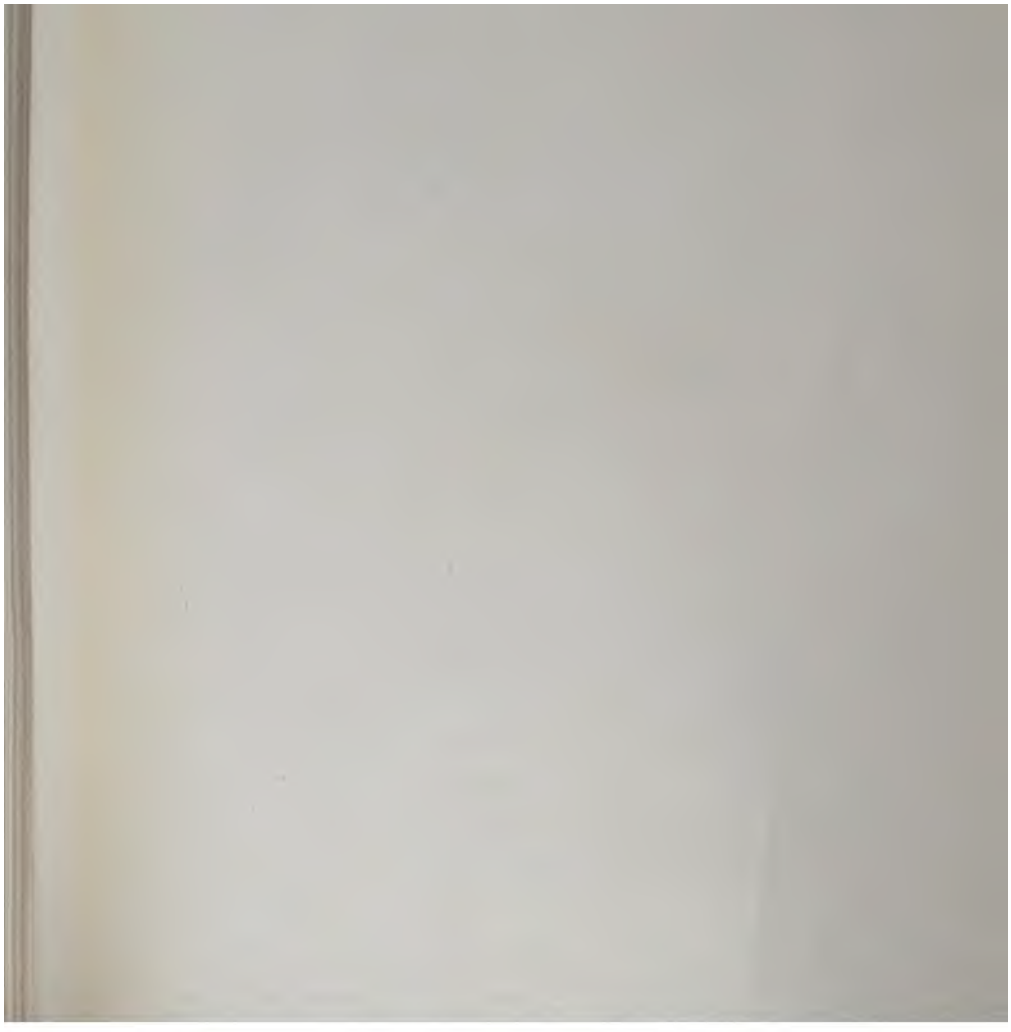


FIG. 48.

FIG. 49.

FIG. 50.

FIG. 51.

FIG. 52.

FIG. 53.

FIG. 54.

FIG. 55.

FIG. 56.

FIG. 57.

FIGS. 54-66.—Series of 13 consecutive transverse sections of *Agamodistomum nanus*, showing the anatomy. Note the esophagus (*es.*, 54), its bifurcation (*es.*, 55), the intestinal ceca (*i.*, 56 to 65), the ventral acetabulum (*ac.*, 60 to 61), the genital primordium (*pr. g.*) and pore (*g. p.*, 63 to 65), the excretory canals (*ex. c.*, especially in 65).

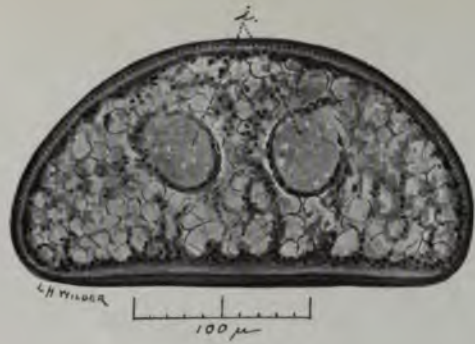


FIG. 58.

FIG. 59.

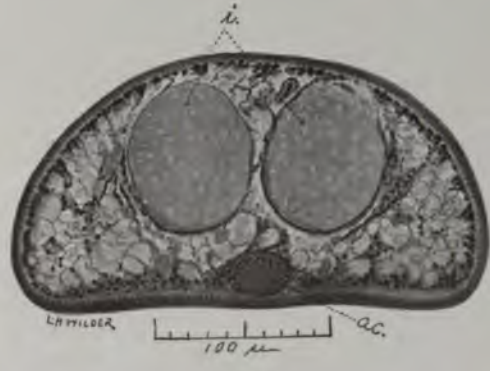


FIG. 60.

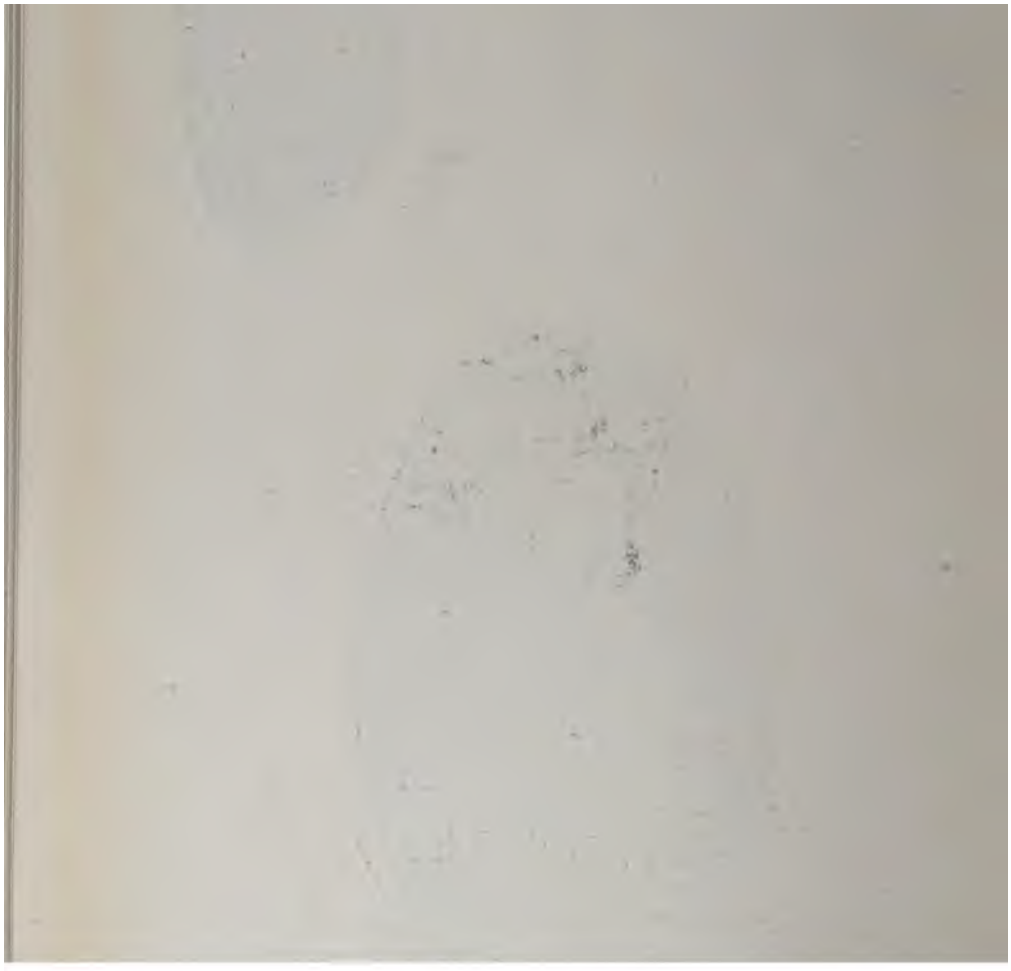


FIG. 61.

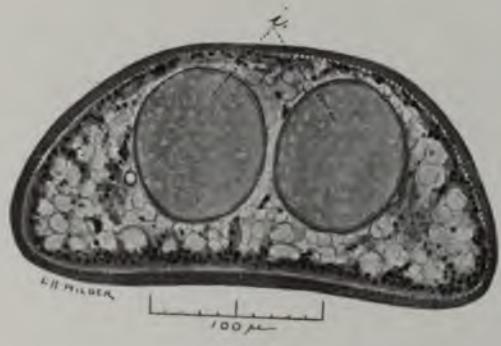


FIG. 62.

FIG. 63.

FIG. 48.

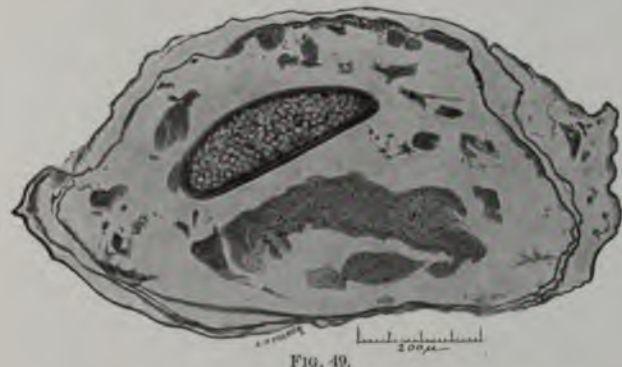


FIG. 49.

FIG. 50.

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O

TREASURY DEPARTMENT.
Public Health and Marine-Hospital Service of the United States.

HYGIENIC LABORATORY.—BULLETIN No. 42.
January, 1908.

THE THERMAL DEATH POINTS OF PATHOGENIC MICRO-ORGANISMS IN MILK

By
M. J. ROSENAU,
Director Hygienic Laboratory.

WASHINGTON:
GOVERNMENT PRINTING OFFICE.
1908.

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THE THERMAL DEATH POINTS OF PATHOGENIC MICRO-ORGANISMS IN MILK.[a]

By MILTON J. ROSENAU,

Surgeon and Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

INTRODUCTION.

The temperature at which milk should be pasteurized hinges on the thermal death points of the pathogenic micro-organisms which contaminate it. The pathogenic micro-organisms most frequently found in market milk are those causing tuberculosis, typhoid fever, diphtheria, scarlet fever, dysentery, and Malta fever. Fortunately none of the organisms causing the above-mentioned diseases has resisting spores. Moderate degrees of heat are, therefore, sufficient to render milk safe so far as these dangers are concerned. The streptococci, staphylococci, and most of the bacteria associated with infantile diarrhea are also readily destroyed by heat.

Although it would appear to be a comparatively simple matter to determine precisely the temperature at which micro-organisms die, such work is in fact surrounded by many difficulties and pitfalls; different investigators have come to widely different results. Some of these discrepancies are only apparent and may be explained by the relation of time to temperature. The longer the time of exposure, the lower the temperature necessary to kill any organism. Differences in methods are also responsible for differences in results. Thus some workers start with the fluid containing the micro-organisms to be tested at room temperature and raise it to the desired temperature; others introduce the bacteria after the fluid has been heated.

Care must be taken in thermal death-point work to see that the entire volume of the water bath, as well as the fluid medium tested, has approximately the same temperature throughout. Unless attention to this point is given, a difference of 5° to 10° C. between the top

[a] Manuscript submitted for publication February 11, 1908.

and bottom layers of the fluid may be found and misleading results obtained. Again, unless a reasonably accurate thermometer is used further inaccuracies may result, for ordinary thermometers not infrequently have errors of several degrees.

Among bacteria some strains or races are more resistant to heat than others. These differences, which correspond to similar known variations in all animal and vegetable species, must be taken into account.

The individual micro-organisms in any particular culture vary so far as their resistance to heat is concerned. Not all the bacteria are killed at once. Thus it will be seen from the tables that the vast bulk of the bacteria succumb at a certain temperature, while a few hardy individuals resist several degrees higher heat or several minutes longer exposure. It is evident that when we reach the point where only a few organisms remain alive in the fluid, the results may be irregular or vary, depending upon the amount of fluid transplanted into the culture medium.

The physical and chemical composition of the fluid in which the tests are made also exerts a decided influence. Some bacteria are sensitive to acid, others to alkali. If the tests are made in pure water, we have to deal with differences in osmotic pressure (plasmolysis). If the tests are made in an albuminous, viscid, or fatty medium, protecting envelopes may form and act as insulating coverings.

Evaporation takes place so rapidly from exposed fluids that the surface layer may remain cooler than the body of the liquid. This is especially a matter of concern with milk, which sometimes forms a scum above 60° C., owing to rapid evaporation of the surface layer. This scum consists of coagulated albumins in which is enmeshed much fat. The bacteria entangled in this surface pellicle may escape the heat indicated by the thermometer in the deeper layers.

A matter of very great importance is the suitability of the medium into which the bacteria are planted, as well as the temperature and the other conditions of incubation, etc. The optimum conditions may only be realized by a special study of each micro-organism tested. Controls must always show prompt and vigorous growth.

The concentration of the suspension and other differences in the conditions of the experiment account for some of the variations in the results recorded by different observers. If a test tube is used, care must be taken that the glass be thin and that the test fluid be well below the surface of the heated water. It is especially important to prevent soiling of the walls of the test tube above the fluid. This may give false results, for the reason that the pipette or instrument used to withdraw the milk or whatever fluid is used may come into [illegible] with the upper portion of the test tube and thereby pick up

bacteria which may have escaped the heat, or the fluid upon the side of the test tube may afterwards flow back.

As a rule, bacteria are attenuated and lose their power to infect before they lose their ability to vegetate upon artifical culture media. It is, therefore, safe to assume that a micro-organism that will not grow in artificial media under favorable conditions is "dead." The tubercle bacillus is an exception to this rule, for reasons given further on.

METHODS.

The methods used in the tests recorded below were planned to imitate the actual conditions of pasteurization, so far as practicable, in laboratory experiments.

Except in the case of the tubercle bacillus, all the organisms were first planted in sterilized milk and not subjected to the tests until an abundant growth was obtained. In order to obtain pure cultures it was first necessary to sterilize the milk, which was done by the fractional method. It is believed that this does not appreciably influence the results obtained. By growing the micro-organisms in milk we perhaps imitate the natural conditions more closely than by using suspensions prepared for the purpose.

All the tests were made by placing the test tube containing the cool infected milk into the water bath at the desired temperature, usually 60° C. The time required for the milk to reach the temperature stated is always given.

The illustration shows how the apparatus was arranged for all the tests. The temperature was controlled within a fraction of a degree; it never varied more than half a degree, and, as a rule, was kept within one or two tenths of a degree. The test tubes containing about 10 to 15 c. c. of milk were immersed so that the level of the milk in the tube was well below the level of the water.

The reaction of the milk was determined by titration with $\frac{N}{10}$ NaOH solution, using phenolphthalein as indicator, and the results are expressed in terms of lactic acid. The reaction of the milk was always taken at the time of testing the thermal death points.[a]

Enrichment methods were used only in the case of cholera, but did not materially alter the results of the simpler methods.

The tests were made with both whole and skimmed milk. As a rule, the milk was first partly skimmed in accordance with the usual

[a] I am indebted to Dr. Joseph H. Kastle, Chief of the Division of Chemistry, for making these tests, as well as for determining the chemical composition of the milks used in the work on *B. tuberculosis*. I am also indebted to my colleagues in the Division of Pathology and Bacteriology, especially Doctors McCoy, Stimson, Miller, King and Anderson, for assistance with the tests thorughout this work. Further I desire to express my special obligations to Doctor Stimson for assistance in collecting the literature upon the thermal death point of the turbercle bacillus.

bacteriologic technic in preparing this culture fluid. Whether whole milk or skimmed milk was used is stated in each instance.

The test tubes in which the infected milk was heated were open to the air, and scum formation was disregarded in all instances, my object being to determine the thermal death point against natural difficulties, so that the results might be applied with confidence to practical pasteurization.

BACILLUS TUBERCULOSIS.

Certain special difficulties are met with in determining the thermal death point of the tubercle bacillus. This organism does not grow readily upon artificial media. The few experiments made to determine its thermal death point by cultural methods have no significance, because its vegetability upon artificial media does not correspond to its power of growing in the animal organism. It is therefore necessary to inoculate animals in order to determine whether or not the tubercle bacillus is alive and virulent. Here again we meet with complications. Dead tubercle bacilli have a certain amount of pathogenic power and produce lesions, including tubercle formation, abcesses, and coagulation necrosis. However, while we lack a criterion to determine with precision the exact point when the tubercle bacillus dies, we are able by means of animal inoculations to determine just when the tubercle bacillus is so enfeebled that it is no longer able to infect. This, after all, is the important practical point.

ORIGINAL EXPERIMENTS.

In all the tubercle experiments raw whole milk was used, the chemical composition of which is stated in each case. The number of bacteria other than the tubercle bacillus was determined by the usual method on agar plates.

The young tubercle cultures were rubbed up with the milk in a mortar until a fairly uniform suspension was obtained. Otherwise the methods used were those given on page 9.

Nine experiments were made with five different bovine cultures, the details of which will be found in the following tables. The results are consistent so far as the thermal death point is concerned. The only irregularity will be found in Table No. 1, guinea pig No. A12. This animal did not have lesions differing markedly from those caused by dead tubercle bacilli; but the secondary guinea pig (A12[1]) died as a result of generalized tuberculosis, affecting especially the lungs. The secondary guinea pig, inoculated with the lesions of A9, remained well. The other animals of this series, namely, A7, A8, A10, and A11, evidently did not have an active tuberculosis due to living and virulent tubercle bacilli.

						liver and spleen both have caseous nodules; anterior mediastinal glands enlarged and caseous; lung contains one small nodule.
A5	5 minutes at 60°	265	375	.....do.....	Tuberculosis (?).....	Small noncaseous nodule in abdominal wall at site; few nodules not caseous in omentum. *A secondary guinea pig* inoculated with emulsion of lesions and glands (site, omentum, spleen, liver, and lung of A5) developed generalized tuberculosis and died in 45 days.
A6	.....do.....	270	430	Died in 8 hours following injection of tuberculin (2 c. c.) on 97th day.	Generalized tuberculosis.	Omentum thick as one's little finger and caseous; celiac group of glands large and caseous; anterior mediastinal glands enlarged; yellow nodules in substance of liver, spleen, and kidney.
A7	10 minutes at 60°	275	360	Chloroformed 55th day...	Negative.....	Inguinal glands enlarged; small nodule, not caseous, in abdominal wall at site; few noncaseous nodules in omentum.
A8	.....do.....	275	575	Chloroformed 98th day...	.....do.....	Seemed slightly sick following subcutaneous inoculation 2 c. c. tuberculin, but recovered; normal throughout at autopsy.
A9	15 minutes at 60°	280	370	Chloroformed 55th day...	.....do.....	Small caseous abscess at site in abdominal wall; small nodule in mesentery; several smaller nodules on peritoneum posteriorly; spleen normal but bound to surrounding parts; omentum contains numerous nodules, some caseous. *A secondary guinea pig* inoculated into the peritoneal cavity with an emulsion of the lesions and apparently normal glands of A9 (viz, site, liver, spleen, peritoneal nodules, and omentum) remained normal and gained weight; when tested with 2 c. c. tuberculin on the 108th day it did not respond; no lesions at autopsy.
A10	.....do.....	280	600	Chloroformed 98th day...	.....do.....	Seemed sick, but did not die, as result of subcutaneous inoculation 2 c. c. tuberculin; few hard nodes in omentum.
A11	20 minutes at 60°	280	300	Chloroformed 55th day...	.....do.....	Caseous abscess in abdominal wall at site; noncaseous nodules in omentum; spleen bound to surrounding parts, otherwise normal; nodules on diaphragmatic peritoneum; otherwise normal.
A12	.....do.....	280	300	Died in 9 hours following injection of tuberculin (2 c. c.) on 97th day.	Negative (?)	Caseous nodes in omentum; celiac group of glands size of a marble; anterior mediastinal glands enlarged; yellowish nodules in liver and spleen. *A secondary guinea pig* inoculated into the peritoneal cavity with the lesions and glands of A12 developed generalized tuberculosis, especially of the lungs; died in 54 days.

TABLE No. 2.—*Series B.*

Bovine culture, IXb2, from Theobald Smith.

Twenty cubic centimeters of market milk heavily inoculated from a glycerin-agar slant.

Stained smears showed numerous bacilli in each field, also a few small clumps.

Composition of the milk: Specific gravity, 1.0308; fat, 3.7; total solids, 12.3; solids not fat, 8.6, ash, 0.63; acidity, 0.15; refractometer, 40.3; sediment, 0.07; milk sugar, 4.81; no coloring matter; no preservatives.

This milk contained 2,440,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and 1,380 at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
B1	Control; 25° C. (at start)...	255	235	Died on 23d day.....	Generalized tuberculosis.	Emaciation; tuberculosis of inguinal glands, peritoneum, liver, spleen, lungs, mediastinal glands, and omentum.
B2	60° (took 4¼ minutes to heat from 25° to 60°).....	255	425	Died in 7 hours following injection of tuberculin (2 c. c.) on 82d day.	.....do.....	Inguinal glands enlarged; mesenteric glands size of small marble near pylorus, not caseous; tuberculosis of spleen; anterior mediastinal gland enlarged; ileolumbar gland enlarged and caseous.
B3	1 minute at 60°.....	255	425	Died in 4 hours following injection of tuberculin (2 c. c.) on 82d day.	.....do.....	Emaciation; inguinal, axillary and mediastinal glands caseous; large caseous nodule at site; spleen and liver full of tubercles; nodules on peritoneum and in lungs.
B4	7 minutes at 60°.....	260	250	.....do.....	.....do.....	Inguinal glands large and caseous; nodules on peritoneum; spleen and liver full of tubercles; retroperitoneal glands caseous; omentum full of hard nodules; anterior mediastinal glands enlarged.
B5	10 minutes at 60°.....	260	315	.....do.....	.....do.....	Inguinal and mediastinal glands enlarged; nodules on peritoneum; retroperitoneal glands caseous; tubercles in liver, spleen, testicles, and lungs.
B6	12 minutes at 60°.....	265	425	Died in 4 hours following injection of tuberculin (2 c. c.) on 93d day.	.....do.....	Inguinal, axillary, and mediastinal glands enlarged; tubercles on peritoneum, and in spleen, liver, omentum, and lungs.
B7	15 minutes at 60°.....	265	500	Chloroformed 82d day....	Negative.....	No evidence of tuberculosis at autopsy.

						liver and spleen both have caseous nodules; anterior mediastinal glands enlarged and caseous; lung contains one small nodule.
A5	5 minutes at 60°	265	375	.....do.....	Tuberculosis (?).....	Small noncaseous nodule in abdominal wall at site; few nodules not caseous in omentum. *A secondary guinea pig* inoculated with emulsion of lesions and glands (site, omentum, spleen, liver, and lung of A5) developed generalized tuberculosis and died in 45 days.
A6	.....do.....	270	430	Died in 8 hours following injection of tuberculin (2 c. c.) on 97th day.	Generalized tuberculosis.	Omentum thick as one's little finger and caseous; celiac group of glands large and caseous; anterior mediastinal glands enlarged; yellow nodules in substance of liver, spleen, and kidney.
A7	10 minutes at 60°	275	360	Chloroformed 55th day...	Negative.....	Inguinal glands enlarged; small nodule, not caseous, in abdominal wall at site; few noncaseous nodules in omentum.
A8	.....do.....	275	575	Chloroformed 98th day...	.....do.....	Seemed slightly sick following subcutaneous inoculation 2 c. c. tuberculin, but recovered; normal throughout at autopsy.
A9	15 minutes at 60°	280	370	Chloroformed 55th day...	.....do.....	Small caseous abscess at site in abdominal wall; small nodule in mesentery; several smaller nodules on peritoneum posteriorly; spleen normal but bound to surrounding parts; omentum contains numerous nodules, some caseous. *A secondary guinea pig* inoculated into the peritoneal cavity with an emulsion of the lesions and apparently normal glands of A9 (viz, site, liver, spleen, peritoneal nodules, and omentum) remained normal and gained weight; when tested with 2 c. c. tuberculin on the 108th day it did not respond; no lesions at autopsy.
A10	.....do.....	280	600	Chloroformed 98th day...	.....do.....	Seemed sick, but did not die, as result of subcutaneous inoculation 2 c. c. tuberculin; few hard nodes in omentum.
A11	20 minutes at 60°	280	300	Chloroformed 55th day...	.....do.....	Caseous abscess in abdominal wall at site; noncaseous nodules in omentum; spleen bound to surrounding parts, otherwise normal; nodules on diaphragmatic peritoneum; otherwise normal.
A12	.....do.....	280	300	Died in 9 hours following injection of tuberculin (2 c. c.) on 97th day.	Negative (?)	Caseous nodes in omentum; celiac group of glands size of a marble; anterior mediastinal glands enlarged; yellowish nodules in liver and spleen. *A secondary guinea pig* inoculated into the peritoneal cavity with the lesions and glands of A12 developed generalized tuberculosis, especially of the lungs; died in 54 days.

TABLE No. 2.—*Series B.*

Bovine culture, IXb2, from Theobald Smith.

Twenty cubic centimeters of market milk heavily inoculated from a glycerin-agar slant.

Stained smears showed numerous bacilli in each field, also a few small clumps.

Composition of the milk: Specific gravity, 1.0308; fat, 3.7; total solids, 12.3; solids not fat, 8.6, ash, 0.63; acidity, 0.15; refractometer, 40.3; sediment, 0.07; milk sugar, 4.81; no coloring matter; no preservatives.

This milk contained 2,440,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and 1,380 at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
B1	Control; 25° C. (at start)...	255	235	Died on 23d day.....	Generalized tuberculosis.	Emaciation; tuberculosis of inguinal glands, peritoneum, liver, spleen, lungs, mediastinal glands, and omentum.
B2	60° (took 4½ minutes to heat from 25° to 60°).....	255	425	Died in 7 hours following injection of tuberculin (2 c. c.) on 82d day.	.....do.....	Inguinal glands enlarged; mesenteric glands size of small marble near pylorus, not caseous; tuberculosis of spleen; anterior mediastinal gland enlarged; ileolumbar gland enlarged and caseous.
B3	1 minute at 60°.....	255	425	Died in 4 hours following injection of tuberculin (2 c. c.) on 82d day.	.....do.....	Emaciation; inguinal, axillary and mediastinal glands caseous; large caseous nodule at site; spleen and liver full of tubercles; nodules on peritoneum and in lungs.
B4	7 minutes at 60°.....	260	250	.....do.....	.....do.....	Inguinal glands large and caseous; nodules on peritoneum; spleen and liver full of tubercles; retroperitoneal glands caseous; omentum full of hard nodules; anterior mediastinal glands enlarged.
B5	10 minutes at 60°.....	260	315	.....do.....	.....do.....	Inguinal and mediastinal glands enlarged; nodules on peritoneum; retroperitoneal glands caseous; tubercles in liver, spleen, testicles, and lungs.
B6	12 minutes at 60°.....	265	425	Died in 4 hours following injection of tuberculin (2 c. c.) on 93d day.	.....do.....	Inguinal, axillary, and mediastinal glands enlarged; tubercles on peritoneum, and in spleen, liver, omentum, and lungs.
B7	15 minutes at 60°.....	265	500	Chloroformed 82d day....	Negative.....	No evidence of tuberculosis at autopsy.

B8	18 minutes at 60°	265	475	Died in 12 hours following injection of tuberculin (2 c. c.) on 82d day.	Do.
B9	20 minutes at 60°	270	415	Died in 15 hours following injection of tuberculin (2 c. c.) on 82d day.	A small caseous focus in one ileolumbar gland; otherwise normal.

TABLE NO. 3.—*Series C.*

Bovine culture, IXb2, from Theobald Smith.

Twenty cubic centimeters of market milk heavily inoculated from a glycerin-agar slant.

Stained smears showed numerous bacilli in each field, also occasional clumps.

Composition of the milk: Specific gravity, 1.0308; fat, 3.7; total solids, 12.3; solids not fat, 6; ash, 0.63; acidity, 0.15; refractometer, 40.3; sediment, 0.07; milk sugar, 4.81; no coloring matter; no preservatives.

This milk contained 2,440,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and 1.380 at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
C1	Control; 29° C. (at start)	300	255	Died on 19th day	Generalized tuberculosis.	Emaciation; cheesy nodule at site; tuberculosis of inguinal and axillary glands, peritoneum, omentum, lungs, and pleura.
C2	.....do	270	215	.....do	.....do	Emaciation; tuberculosis of inguinal, axillary, mesenteric and mediastinal glands; liver and spleen enlarged and full of nodules; omentum rolled up into one large caseating mass; tubercles in both lungs.
C3	60° (took 1½ minutes to heat from 29° to 60°).	290	250	Died on 24th day	.....do	Emaciation; caseous nodule at site; inguinal glands enlarged; general miliary tuberculosis of peritoneum; whitish and yellow nodule in spleen and liver; abdominal and mediastinal glands caseous; omentum rolled up into a hard mass with softened areas.
C4	65° (took 5 minutes to heat from 29° to 65°).	285	270	Died on 29th day	Negative	No evidence of tuberculosis at autopsy; inguinal glands moderately enlarged; adhesions between omentum and abdominal wall; stomach dilated; otherwise normal.
C5	1 minute at 65°	300	600	Chloroformed 93d day	.....do	Did not react to 2 c. c. tuberculin; pregnant; caseous nodule in omentum; otherwise normal. *Secondary guinea pig* inoculated intraperitoneally with emulsion of omental nodules, pancreas, etc., of C5 gained weight, did not respond to 2 c. c. tuberculin on 69th day; autopsy negative.

C6	5 minutes at 65°.....	300	550	.....do.....	.....do.....	Became sick, but did not die following tuberculin; normal at autopsy excepting a nodule, not caseous, in pancreas. *Secondary guinea pig* (same details as C5), negative.
C7	8 minutes at 65°.....	325	600	Died on 90th day.....	.....do.....	Streptococcal double pneumonia; no evidence of tuberculosis at autopsy.
C8	10 minutes at 65°.....	325	520	Chloroformed 93d day....	.....do.....	Did not react to tuberculin; normal at autopsy except a caseous enlargement in omental pancreas, with adhesions to abdominal wall. *Secondary guinea pig* (same detail as C5), negative.
C9	15 minutes at 65°.....	330	520	Died in 9 hours, following injection of tuberculin (2 c. c.) on 93d day.	.....do.....	Well-preserved, pregnant; excess peritoneal fluid; small caseous abscess at site; few nodules in omentum, some softened; adhesions between liver and stomach. *Secondary guinea pig* (same details as C5), negative.

TABLE NO. 4.—*Series A.*

Bovine culture, Bovine III, from Department of Agriculture.

Twenty cubic centimeters special market milk rubbed up with culture.

Stained smears of the milk thus infected showed numerous bacilli lying separately in every field, few in clusters.

Composition of the milk: Specific gravity, 1.0321; fat, 4.2; total solids, 12.9; solids not fat, 8.7; ash, 0.63; acidity, 0.149; refractometer, 41: sediment, —; milk sugar, 4.83; no coloring matter; no preservatives.

This milk contained 2,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and none at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

The temperature during this experiment averaged from 59.7° to 60.3° C.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
D1	Control; 24.5° C. (at start).	225	190	Died on 11th day	Generalized tuberculosis.	Emaciation; inguinal glands enlarged; 1 anterior mediastinal gland caseous; nodules on peritoneum; omentum many nodules, some size of pea, none softened; spleen fibrinous peripheric splenitis.
D2	do	230	190	Died on 27th day	do	Emaciation; excess fluid in peritoneal cavity; peritoneum studded with tubercles; caseous mass at site; omentum rolled up, large, hard, and caseous; liver, intestines, spleen, etc., bound together; lungs contained tubercles; inguinal, axillary, and mesenteric glands enlarged.
D3	60° (took 5½ minutes to heat from 24.5° to 60°).	235	335	Died in 6 hours, following injection of tuberculin (2 c. c.) on 61st day.	do	Hard nodules at site, not caseous; inguinal glands enlarged; excess clear fluid in peritoneal cavity; small nodules on peritoneal surface; omentum contains soft nodules; liver, spleen enlarged, and full of tubercles; anterior mediastinal gland enlarged; tubercle in lung.
D4	2 minutes at 60°	235	400	Died in 6 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Inguinal and axillary glands enlarged, caseous; excess clear fluid in peritoneal cavity; spleen, liver enlarged, full of tubercles; omentum, several hard caseous nodules; caseous tubercles on testicle; mediastinal and bronchial glands large, caseous; ileolumbar gland involved; tubercle in lung.
D5	5 minutes at 60°	240	365	Died in 5 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Inguinal and axillary glands enlarged; diaphragm studded with nodules; liver mottled with large yellow areas; spleen large and numerous tubercles; caseous nodules in omentum; pancreas, mediastinal, bronchial, and mesenteric glands much enlarged.
D6	10 minutes at 60°	245	450	Died in 14 hours following injection of tuberculin (2 c. c.) on 76th day.	Negative	Excess clear fluid in peritoneal cavity; few hard nodules, one caseous, in omentum; bronchial glands enlarged; otherwise normal.
D7	15 minutes at 60°	250	380	Died in 15 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Moderate enlargement of inguinal glands; peritoneal fluid excessive; caseous nodules in omentum and caseous abscess between spleen and kidney; small caseous abscess at site of inoculation; bronchial glands slightly enlarged.

						Secondary guinea pig inoculated intraperitoneally with emulsion of lesions of D7 remained well, did not respond to 2 c. c. tuberculin on the 71st day, gained weight; no lesions at autopsy.
D8	18 minutes at 60°	250	.....	Died on 5th day	do	Death due to peritonitis resulting from intestinal perforation.
D9	20 minutes at 60°	250	500	Died in 7 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Slight excess clear fluid in peritoneal cavity; omentum contains a caseous nodule; perisplenitis; otherwise normal.
						Secondary guinea pig (see D7), negative.
D10	23 minutes at 60°	250	550	Chloroformed 76th day	do	Seemed sick as a result of tuberculin injection, but recovered; no lesions at autopsy.
D11	25 minutes at 60°	250	205	Died on 15th day	do	Omentum contains few small nodules, not caseous; slight enlargement of inguinal, axillary, and mediastinal glands; all else normal.
D12	28 minutes at 60°	250	475	Died in 6 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Not emaciated; caseous nodule at site; excess clear fluid in peritoneum; few small nodules in omentum; otherwise normal.
D13	30 minutes at 60°	250	440	Died in 12 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Caseous nodule in pancreas and omentum; nodule on peritoneal surface of diaphragm.
						Secondary guinea pig (same details as D7), negative.
D14	35 minutes at 60°	255	500	Chloroformed 76th day	do	Became sick following tuberculin reaction, but recovered; nothing abnormal at autopsy excepting a few grayish patches on spleen not resembling tubercles.
						Secondary guinea pig (same details as D7), negative.
D15	40 minutes at 60°	260	460	Died in 12 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Omental pancreas thickened and contains caseous lumps, some 3 mm. in diameter; patches of perisplenitis and one perinephritis.
						Secondary guinea pig (same details as D7), negative.
D16	45 minutes at 60°	265	430	Died in 10 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Caseous nodules in pancreas and omentum; caseous abscess over right kidney; small hard nodule on diaphragm.
						Secondary guinea pig (same details as D7), negative.
D17	50 minutes at 60°	265	520	Died in 12 hours following injection of tuberculin (2 c. c.) on 76th day.	do	Omental pancreas enlarged and nodular; one ileolumbar gland and inguinal glands enlarged, but not caseous; whitish area on edge of spleen; otherwise normal.
						Secondary guinea pig (same details as D7), negative.
D18	60 minutes at 60°	265	500	Chloroformed 76th day	do	Failed to react to subcutaneous injection of 2 c. c. tuberculin; nothing abnormal found at autopsy.

E5	2 minutes at 65°	280	350	Died in 5 hours following injection of tuberculin (2 c. c.) on 77th day.	do	Caseous nodules in diaphragm and omentum; excess of peritoneal fluid. *Secondary guinea pig*, negative.
E6	3 minutes at 65°	280	400	Died in 17 hours following injection of tuberculin (2 c. c.) on 77th day.	do	Caseous nodules in omentum; same in region of each ovary; hard, noncaseous nodules on under surface of diaphragm; bronchial glands enlarged. *Secondary guinea pig*, negative.
E7	5 minutes at 65°	285	195	Died in 12 hours following injection of tuberculin (2 c. c.) on 77th day.	do	Omentum reduced to cheesy sac; large nodule on diaphragm; bronchial glands enlarged; few small yellow patches in liver and one in spleen. *Secondary guinea pig*, negative.
E8	8 minutes at 65°	285	480	Died in 13 hours following injection of tuberculin (2 c. c.) on 77th day.	do	Nothing abnormal found at autopsy. Secondary guinea pig (same as E4), negative.
E9	10 minutes at 65°	290	445	do	do	Caseous nodule in omentum; otherwise normal. *Secondary guinea pig*, negative.
E10	12 minutes at 65°	290	425	Chloroformed 77th day	do	Did not react to subcutaneous injection of 2 c. c. tuberculin; nodules on diaphragm, pleura; mediastinal glands enlarged, not caseous; omentum thickened, but no nodules; no caseation except glandular enlargements; no definite findings. *Secondary guinea pig*, negative.
E11	15 minutes at 65°	300	490	Died in 10 hours following injection of tuberculin (2 c. c.) on 77th day.	do	Caseous abscess at site; caseous nodules in omentum and between liver and intestine. *Secondary guinea pig* died in 7 days from septic peritonitis; no evidence of tuberculosis.
E12	20 minutes at 65°	260	400	Died in 13 hours following injection of tuberculin (2 c. c.) on 77th day.	do	Caseous nodules in omentum, 1 in spleen, and between spleen and kidney, and between kidney and liver; all else normal. *Secondary guinea pig*, negative.

TABLE No. 6.—*Series F.*

Bovine culture, B I, from Trudeau, Saranac Laboratory.

This culture was obtained from a cheesy mass in the apex of left lung of a cow reacting to tuberculin test at 41.1° C. on September 28, 1902; age of cow, 18 to 20 years.

Some of the caseous material inoculated into guinea pigs and the culture recovered from the inguinal glands of the guinea pigs on Löffler's sheep serum, subculture on cow serum.

A moderately heavy suspension was rubbed up in a sample of mixed market milk.

Upon smears some bacilli were found in each field, lying singly and in clusters.

Composition of the milk: Specific gravity, 1.03; fat, 4.8; total solids, 13.5; solids not fat, 8.7; ash, —; acidity, 0.149; refractometer, 41; sediment, 0.07; milk sugar, —; no coloring matter; no preservatives.

This milk contained 880,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and none at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
F1	Control; 28° C. (at start)..	265	315	Died in 5 hours following injection of tuberculin (2 c. c.) on 59th day.	Generalized tuberculosis.	Emaciation and very extensive generalized tuberculosis of all organs, except lungs; inguinal glands caseous.
F2	.....do.....	250	450	Died in 18 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Fairly well preserved; pronounced generalized tuberculosis; 1 inguinal gland caseous; abscess at site; spleen and omentum contain many tubercles, also liver; mediastinal and hepatic glands caseous; areas in lung perhaps tuberculous.
F3	60° (took 4 minutes to heat from 28° to 60°).	280	475	Died in 5 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Inguinal glands enlarged and caseous; axillary glands enlarged; caseous nodule at site; spleen very large and filled with tubercles; omentum has numerous hard and caseous nodules; tubercles in liver; anterior mediastinal gland enlarged, also bronchial glands which are caseous.

F4	1 minute at 60°	280	500	Died in 20 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Well-preserved caseous abscess in abdominal wall at site; few small, hard caseous nodules in omentum; tubercles in spleen, which is bound down; liver contains disseminated tubercles; bronchial glands enlarged and caseous.
F5	2 minutes at 60°	275	440	Died in 19 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Omentum contains hard nodules, not caseous; tubercles on spleen; few nodules on surface of liver; bronchial glands enlarged.
F6	3 minutes at 60°	290	475	Chloroformed 60th day...	Negative.....	Did not react to tuberculin injection (2 c. c.) subcutaneously; normal at autopsy except small yellow nodule on spleen.
F7	4 minutes at 60°	270	430	Died in 14 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Well nourished; hard subsplenic nodule; omentum nodular; no caseation; nothing else abnormal.
F8	5 minutes at 60°	250	465	.....do.....	.....do.....	Few hard nodules in omentum, none caseous; otherwise normal.
F9	7 minutes at 60°	280	445	Chloroformed 60th day...	.....do.....	Did not react to tuberculin injection (2 c. c.) subcutaneously; few hard caseous nodules in omentum; otherwise normal.
F10	10 minutes at 60°	320	510	.....do.....	.....do.....	Did not react to tuberculin injection (2 c. c.) subcutaneously; 1 small hard nodule in omentum; no caseation; otherwise normal.
F11	15 minutes at 60°	335	400	.....do.....	.....do.....	Did not react to tuberculin injection (2c.c.) subcutaneously; 1 large caseous nodule in omentum.
F12	20 minutes at 60°	280	480	.....do.....	.....do.....	Did not react to tuberculin injection (2 c. c.) subcutaneously; hard nodules in omentum; no caseation; perisplenitis; otherwise normal.
F13	30 minutes at 60°	310	550	Died in 18 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Well nourished; small caseous abscess in abdominal wall and at site; small patch perisplenitis; few nodules in omentum, one caseous; bronchial glands enlarged.
F14	40 minutes at 60°	270	525	Chloroformed 60th day...	.....do.....	Did not react to tuberculin injection (2c.c.) subcutaneously; well preserved, nothing abnormal found at autopsy.
F15	50 minutes at 60°	265	440	Died in 18 hours following injection of tuberculin (2 c. c.) on 59th day.	.....do.....	Well preserved; caseous nodule about the size of a pea in right seminal vesicle; several hard and caseous tubercles in omentum; spleen adherent; 1 mesenteric gland caseous; otherwise normal.

TABLE No. 7.—*Series G.*

Bovine culture, H Rav, from the Rockefeller Institute for Medical Research.

This culture was kindly sent me by Dr. Flexner, who states that it was isolated from the mesenteric gland of a cow.

A heavy suspension rubbed up in a small quantity of mixed market milk.

Stained smears showed numerous bacilli in each field and also numerous clumps of various sizes.

Composition of the milk: Specific gravity, 1.03; fat, 4.8; total solids, 13.5; solids not fat, 8.7; ash, —; acidity, 0.149; refractometer, 41.0; sediment, 0.07; milk sugar, —; no coloring matter; no preservatives.

This milk contained 880,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and none at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
G1	Control; 27° C. (at start)...	310	265	Died on 18th day.....	Generalized tuberculosis.	Emaciation; generalized miliary tuberculosis; deposit upon peritoneum and tunica vaginalis; omentum rolled up and contains many large and small nodules; spleen enlarged and tuberculous; anterior mediastinal glands caseous; caseous abscess at site in abdominal wall; femoral glands enlarged.
G2	.....do.....	315	340	Died on 29th day.....	.....do.....	Emaciation; caseous abscess in abdominal wall at site; superficial glands enlarged; peritoneum studded with nodules, contains sanious fluid; omentum one large hard and caseous mass; tubercles in spleen and lungs; mediastinal glands enlarged.
G3	60° (took 4½ minutes to heat from 27° to 60°).	270	550	Died in 6 hours following injection of tuberculin (2 c. c.) on 63d day.	Localized tuberculosis.	Well preserved; omentum contains few hard and caseous nodules; ileolumbar gland size of pea and caseous; mesenteric glands enlarged, not softened; glands and celiac axis enlarged and size of filbert, caseous.
G4	1 minute at 60°.....	290	400	Died on 44th day.....	Negative.....	Streptococcal double pneumonia; well preserved; one caseous gland in axilla; few hard nodules in omentum; one retroperitoneal gland caseous; otherwise normal.

G5	2 minutes at 60°	320	495	Died in 6 hours following injection of tuberculin (2 c. c.) on 63d day.	do	Omentum contains few small nodules, one caseous; iliolumbar glands enlarged and caseous; glands in region of celiac axis enlarged and caseous; few mesenteric glands enlarged, but not caseous.
G6	3 minutes at 60°	280	375	Died on 31st day	do	Double streptococcal pneumonia; well preserved; no lesions indicating tuberculosis at autopsy.
G7	4 minutes at 60°	265	575	Died in 19 hours following injection of tuberculin (2 c. c.) on 65th day.	do	No indications of tuberculosis at autopsy.
G8	5 minutes at 60°	260	225	Died on 16th day	do	Do.
G9	7 minutes at 60°	325	285	Died on 14th day	do	Double pneumonia (streptococcal); few whitish firm noncaseous nodules posteriorly under peritoneum.
G10	10 minutes at 60°	290	450	Died in 18 hours following injection of tuberculin (2 c. c.) on 64th day.	do	Left inguinal glands enlarged to size of marble and caseous; few hard nodules in omentum.
G11	15 minutes at 60°	320	480	Died in 11 hours following injection of tuberculin (2 c. c.) on 63d day.	do	Few nodules in omentum; whitish area in spleen; otherwise normal. *Secondary guinea pig* inoculated intraperitoneally with emulsion of lesions of G11 remained well, gained weight, did not respond to 2 c. c. tuberculin on the 65th day; no lesions at autopsy.
G12	20 minutes at 60°	275	350	Died on 50th day	do	Abscess of heart, which contained a large mass occupying whole lower half, yellowish, fluctuating; cocci and bacilli in lymph nodes and spleen smears negative for tubercle bacilli; no evidence of tuberculosis.
G13	30 minutes at 60°	280	490	Died in 13 hours following injection of tuberculin (2 c. c.) on 63d day.	do	Omentum nodular; anterior mediastinal glands enlarged on right side, not caseous; perisplenitis. *Secondary guinea pig* inoculated intraperitoneally with emulsion of lesions; of G13 remained well, gained weight, did not respond to 2 c. c. tuberculin; no lesions at autopsy.
G14	40 minutes at 60°	265	450	Chloroformed 65th day	do	Did not react to tuberculin injection (2 c. c.) subcutaneously; small caseous nodule in abdominal wall at site of inoculation; inguinal glands slightly enlarged; perisplenitis; otherwise normal.
G15	50 minutes at 60°	330	550	do	do	Did not react to tuberculin injection (2 c. c.) subcutaneously; pregnant; abortion; large deep yellow patch on liver; all else normal.

TABLE No. 8.—*Series H.*

Bovine culture, H Rav, from the Rockefeller Institute for Medical Research.

This culture was kindly sent me by Dr. Flexner, who states that it was isolated from the mesenteric gland of a cow.

A heavy suspension rubbed up in a small quantity of mixed market milk.

Stained smears showed numerous bacilli in each field and also numerous clumps of various sizes.

Composition of the milk: Specific gravity, 1.03; fat, 4.8; total solids, 13.5; solids not fat, 8.7; ash, —; acidity, 0.149; refractometer, 41; sediment, 0.07; milk sugar, —; no coloring matter; no preservatives.

This milk contained 880,000 bacteria (other than tubercle bacilli) per cubic centimeter just before it was used for this experiment and none at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
H1	Control; 31° C. (at start)...	250	265	Died on 38th day.....	Generalized tuberculosis.	Emaciation; caseous nodule at site; inguinal and axillary glands enlarged; peritoneum studded with tubercles; spleen enlarged with tubercles; omentum one large hard caseous mass; liver full of tubercles; lungs contains few nodules; mediastinal glands enlarged.
H2	.....do.....	290	210	Died on 35th day.....	.....do.....	Much emaciation; caseous mass at site; inguinal glands enlarged; peritoneum studded with miliary tubercles; liver and spleen enlarged with advanced tuberculosis; omentum large hard caseous mass; tubercles in lungs.
H3	60° (took 5 minutes to heat from 31° to 60°).	255	410	Died in 8 hours following injection of tuberculin (2 c. c.) on 63d day.	Negative.....	Hard noncaseous nodes in omentum; otherwise normal.
H4	1 minute at 60°.....	315	440	Chloroformed 64th day...	.....do.....	Did not die as result of subcutaneous injection 2 c. c. tuberculin; noncaseous node in omentum; otherwise normal.
H5	3 minutes at 60°.....	290	410	.....do.....	..... do.....	Did not react to subcutaneous injection 2 c. c. tuberculin; omentum somewhat shrunken; otherwise normal throughout.

H6	.....do.....	320	520	Died in 8 hours following injection of tuberculin (2 c. c.) on 63d day.	.....do.....	Nothing abnormal found at autopsy.
H7	4 minutes at 60°.....	290	470	Died in 14 hours following injection of tuberculin (2c.c.) on 63d day.	.....do.....	Cheesy nodules in omentum; all else normal.
H8	5 minutes at 60°.....	260	320	Died in 10 hours following injection of tuberculin (2 c.c.) on 63d day.	.....do.....	Omentum somewhat nodular; no other evidence of tuberculosis. *A secondary guinea pig* inoculated with an emulsion of the lesions from H_8 remained normal, gained weight; no evidence of tuberculosis at autopsy; chloro formed 30th day on account of submixillary abscess (streptococci).
H9	7 minutes at 60°.....	255	350	.....do.....	.....do.....	Few nodules in omentum; anterior mediastinal glands enlarged; no other lesions.
H10	10 minutes at 60°.....	305	440	Chloroformed 64th day...	.....do.....	Did not react to subcutaneous injection 2 c. c. tuberculin; few hard nodes in omentum; otherwise normal.
H11	15 minutes at 60°.....	270	485	.....do.....	.....do.....	Did not react to subcutaneous injection 2 c. c. tuberculin; no lesions.
H12	20 minutes at 60°.....	265	450	.....do.....	.....do.....	Did not react to subcutaneous injection 2 c. c. tuberculin; few nodes in omentum; spleen bound down by extensive adhesions; liver dotted with fine yellow spots; slight enlargement of ileolumbar glands; otherwise normal; pregnant. *Secondary guinea pig* inoculated peritoneally with lesion and organs of H_{12} gained weight; did not respond to tuberculin on 64th day; no lesions at autopsy.
H13	30 minutes at 60°.....	290	430	Died in 13 hours following injection of tuberculin (2c.c.) on 63d day.	.....do.....	Few small nodes in omentum; perisplenitis; anterior mediastinal glands enlarged.
H14	40 minutes at 60°.....	310	455	Chloroformed 64th day...	.....do.....	Did not react to subcutaneous injection 2 c. c. tuberculin; few small omental nodes; otherwise normal throughout; pregnant.
H15	50 minutes at 60°.....	260	420	Died in 10 hours following injection of tuberculin (2 c. c.) on 63d day.	.....do.....	Omentum slightly thickened, but not nodular; spleen adherent posteriorly; no evidence of tuberculosis.

TABLE No. 9.—*Series J.*

Bovine Culture, Bovine III, from Department of Agriculture.

Ten-day old culture of glycerin potassium biphosphate broth. The entire pellicle from a 100 c. c. Erlenmeyer flask rubbed up with 15 c. c. of a special (certified) milk.

Stained smears of the milk thus infected showed numerous bacilli lying separately in every field, also stray clumps and clusters.

Composition of the milk: Specific gravity, 1.0321; fat, 4.2; total solids, 12.9; solids not fat, 8.7; ash, 0.63; acidity, 0.149; refractometer, 41; sediment, —; milk sugar, 4.83; no coloring matter; no preservatives.

This milk had a reaction of 0.153 per cent acidity and contained 9,000 bacteria (other than tubercle bacilli) just before it was used for this experiment and 20 at the conclusion of the test.

About 0.5 c. c. injected into the peritoneal cavity of each guinea pig.

No. of guinea pig.	Temperature and time of heating milk.	Weight in grams of guinea pig.		Time and mode of death.	Results.	Remarks.
		Initial.	Final.			
J1	Control; 25° C. (at start)	280	200	Died on 20th day	Generalized tuberculosis.	Emaciation; inguinal glands enlarged; small caseous abscess at site; miliary tubercles studded over peritoneum; tubercles in liver, spleen, lungs; omentum rolled up into hard fibrous and caseous mass.
J2	do	275	225	do	do	Emaciation; inguinal and axillary glands enlarged; small node at site; miliary tubercles on peritoneum; tubercles in liver, spleen, mediastinal glands, and lungs; omentum rolled up into hard fibrous and caseous mass.
J3	do	270	200	Died on 19th day	do	Emaciation; axillary glands enlarged; large caseous abscess at site; miliary tubercles on peritoneum; tubercles in liver, spleen, and lungs.
J4	59.7° (took 5 minutes to heat from 25° to 59.7°).	285	290	Died in 6 hours following injection of tuberculin (2 c. c.) on 36th day.	do	Emaciation; inguinal glands enlarged; caseous abscess in abdominal wall at site; omentum contains large caseous nodules; tubercles in spleen, which is enlarged and bound down; liver, peritoneum, ileolumbar glands, celiac group, mesentery, anterior mediastinal glands, and lungs contain nodes.
J5	60° (took 6 minutes to heat from 25° to 60°).	260	305	Died in 8 hours following injection of tuberculin (2 c. c.) on 36th day.	do	Caseous nodules at site; large caseous areas in spleen, liver, and omentum; anterior mediastinal, celiac group, and retroperitoneal glands enlarged.

J6	1 minute at 60°	270	335	Died in 4 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Right inguinal gland enlarged and caseous; few small nodules on peritoneum; tubercles in spleen, liver, omentum (caseous), ileolumbar glands, celiac group (size of marble and caseous), mesenteric nodes, anterior mediastinal glands, and lungs.
J7	2 minutes at 60°	270	360	Died in 8 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Inguinal gland somewhat enlarged, red; nodules upon surface of diaphragm, in omentum and spleen; surface plaques on spleen and liver; mesenteric and anterior mediastinal glands enlarged.
J8	3 minutes at 60°	265	360	Died in 6 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Small caseous nodule at site; nodules in omentum, some caseous; tubercles in spleen (enlarged), one on edge of liver; lumbar glands, celiac group, mesenteric and mediastinal glands enlarged.
J9	4 minutes at 60°	265	305	Chloroformed 37th day...	Negative.....	Perisplenitis; omentum rolled up and contains many caseous nodules; no definite glandular enlargement; liver has numerous fine light areas, not like tubercles; otherwise normal.
J10	5 minutes at 60°	285	390	Died in 6 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Omentum contains nodes, some caseous; spleen bound down, otherwise normal; liver contains many tubercles (?); celiac group enlarged, not caseous; lumbar glands caseous; mesenteric nodes enlarged.
J11	6 minutes at 60°	250	350	Died in 10 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Small caseous nodule at site; noncaseous nodule in omentum; few yellow areas in substance of spleen and liver; ileolumbar and celiac group enlarged; otherwise normal.
J12	8 minutes at 60°	280	335	Died in 13 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Nodule on under surface of diaphragm and in omentum, not caseous; patches perisplenitis and hepattis; retroperitoneal glands enlarged; otherwise normal.
J13	10 minutes at 60°	290	420	Died in 10 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Nodules on under surface of diaphragm; caseous tubercles in omentum; surface patches on spleen; retroperitoneal, celiac group, and anterior mediastinal glands enlarged.
J14	12 minutes at 60°	250	360	Died in 6 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Few small nodules, not caseous, in omentum; lumbar glands slightly enlarged; spleen bound down posteriorly; one anterior mediastinal gland slightly enlarged; otherwise normal.
J15	15 minutes at 60°	260	270	Chloroformed 37th day...	.....do.....	Did not react to subcutaneous injection 2 c. c. tuberculin; nothing abnormal at autopsy.
J16	20 minutes at 60°	250	305	Died in 6 hours following injection of tuberculin (2 c. c.) on 36th day.	.....do.....	Caseous abscess at site in abdominal wall; few small nodules, 1 caseous, in omentum; perisplenitis; liver bound to anterior abdominal wall; otherwise normal.

Conclusion.—From these experiments it is evident that the tubercle bacillus in milk loses its infective properties for guinea pigs when heated to 60° C. and maintained at that temperature for twenty minutes, or to 65° C. for a much shorter time.

It should be remembered that the milk in these tests was very heavily infected with virulent cultures, indicated by the prompt deaths of the control animals. Milk would practically never contain such an enormous amount of infection under natural conditions. It is justifiable to assume that if 60° C. for twenty minutes is sufficient to destroy the infectiveness of such milk when injected into the peritoneal cavity of a guinea pig, any ordinary market milk after such treatment would be quite safe for human use by the mouth so far as tubercle bacilli are concerned.

THE EFFECTS OF DEAD TUBERCLE BACILLI.

In the foregoing work endeavor was made to distinguish the lesions produced by the dead tubercle bacilli. For comparison a number of animals were inoculated with milk containing dead tubercle bacilli (killed at 100° C.). The necropsy notes of this series, given in Table No. 10, are very instructive, especially when compared with the foregoing work (Tables 1–9).

Prudden and Hodenphyl [a] found "that tubercle bacilli which have been killed by boiling or otherwise, when introduced into the body of the rabbit either beneath the skin or into the serous cavities, or into the blood vessels and the air spaces of the lungs, are capable, as they slowly disintegrate, of stimulating the cells of the tissues where they lodge to proliferation, and to the production of new tissue morphologically similar to tubercle tissue in its various phases. Necrosis of the new-formed cells may occur, but this differs in some respects from the coagulation necrosis induced under the usual conditions. Dead tubercle bacilli are also markedly chemotactic and capable of causing local suppuration and abscess."[b]

James Miller found that[c] "Dead tubercle bacilli can, then, produce changes which in their early stages are the same as those produced by the living organism. They differ in acuteness only. When these dead bacilli are introduced into the body they attract the leucocytes

[a] For further details concerning the effects of dead tubercle bacilli in the body see Prudden & Hodenphyl, N. Y. Med. Journ., June 6 and 20, 1891, and Prudden, ibid, Dec. 5, 1891. For summary of later work, with bibliography, see Herxheimer, Ziegler's Beitr., vol. 33, p. 363; also, Miller, Journ. Path. and Bact., vol. 10, 1905, p. 351.

[b] Delafield, Francis, and Prudden, T. Mitchell: A Text-book of Pathology, 8th ed. New York, Wm. Wood & Co., 1907. 1057 p. Illus. 8°.

[c] Miller, James: "The Histogenesis of the Tubercle" Journal of Pathology and Bacteriology, 1905, vol. 10, pp. 1–48.

of both varieties. The cells take up the organism, the polymorphonuclear forms degenerate; the mononuclear cells are, however, capable of further development, and, probably with the assistance of connective tissue cells, form the epithelioid and giant cells. Inclosed within their cell prison the bacilli undergo a gradual disintegration, setting free a poison which may produce partial death of a cell, or, if in sufficient quantity, may produce the death of many cells. There is not the same activity in the leucocytes, nor the same vacuolation of the protoplasm and development of pseudopodia in the mononuclear forms. The epithelioid cells have not the same size or the same branched appearance, the giant cells are more rounded and smooth. The whole process gives one the impression of less activity. In the later stages the difference is more marked. There is not the same wide distribution and extension of the process, nor is there the same constant addition of new phagocytes at the margin which will become epithelioid cells and help to swell the giant cell. There is, however, in these later stages the same impression of a partial cell necrosis. The bacilli disappear, but the cells persist and show the peculiar hyaline appearance. Further, there is the same polymorphonuclear leucocytosis in the last stage of pseudo-tubercle that we have seen in true tubercle."

In my own experiments, in order to avoid the confusion resulting from the effects produced by dead tubercle bacilli, doubtful lesions were carried over into another animal. These "secondary" guinea pigs appear in Tables Nos. 1 to 9. The method used was as follows:

The lesions, and sometimes the organs, were ground up in a mortar with salt solution, strained through gauze, and the extract thus obtained injected into the peritoneal cavity of a young normal guinea pig. Only two of these secondary guinea pigs developed generalized tuberculosis. The others remained well, gained weight, failed to respond to tuberculin, and gave no evidence of an active tuberculosis at necropsy. Some of these secondary animals had small tuberclelike masses in the omentum, due to absorption of the products introduced into the peritoneal cavity.

Almost all the animals were tested with tuberculin in the hope that this test might distinguish between the lesions of live and of dead tubercle bacilli. This, however, was found not to be the case, for when the eight animals with lesions caused by tubercle bacilli known to be dead, were injected with 2 c. c. of tuberculin (O. T.) (see Table No. 10), three of them died. The series of guinea pigs in this table is instructive further in that it illustrates that dead tubercle bacilli in milk, when injected into the peritoneal cavity, may produce very extensive tubercular lesions with coagulation necroses (caseation), etc.

TABLE No. 10.—*Results of injecting dead tubercle bacilli in milk into the peritoneal cavity of guinea pigs.*

No. of guinea pig.	Date of inoculation.	Tubercle bacilli in milk heated to—	Culture.	Weight in grams.		Subcutaneous inoculation 2 c. c. tuberculin.		Date and manner of death.	Necropsy notes.
				Initial.	Final.	Date.	Result.		
D19	Sept. 12, 1907	100° C. 1 hour...	Bovine III...	270	325	Nov. 7, 1907	Sick; recovered.....	Chloroformed Nov. 8, 1907..	Moderate hemorrhagic local reaction at site of tuberculin inoculation; no edema; hard nodules in omentum, not caseous; perisplenitis; ileolumbar and inguinal glands slightly enlarged.
D20	.....do.....	100° 1 hour.....	.....do.....	265	490	Nov. 12, 1907	.....do.....	Chloroformed Nov. 13, 1907.	Very marked hemorrhagic and edematous reaction at site of tuberculin inoculation; no glandular enlargements; few hard nodules in omentum; pregnant.
F16	Sept. 9, 1907	100° 30 minutes.	B1 Saranac...	260	500	Nov. 7, 1907	No effect.....	Chloroformed Nov. 8, 1907..	Enlarged mesenteric glands, not caseous.
G16	.....do.....	100° 10 minutes.	H Rav, Rockefeller Institute.	280	465	Oct. 25, 1907	Sick; recovered.....	Chloroformed Oct. 26, 1907..	Edema and hemorrhagic reaction at site of tuberculin inoculation; fine miliary nodules like tubercles on peritoneum; liver mottled with fine tubercle-like areas; omentum contains nodules, not caseous.
J17	Oct. 7, 1907	100° 1 hour.....	Bovine III...	255	355	Nov. 12, 1907	Died in 8 hours.....	.....	Emaciation; hemorrhagic and edematous reaction at site of tuberculin inoculation; inguinal glands slightly enlarged and reddened; caseous nodule in abdominal wall at site of inoculation; peritoneum smooth; excess fibro-serous fluid in peritoneal cavity; omentum rolled up into large tuberculous mass containing numerous caseous foci; perisplenitis; cœliac

									group of glands enlarged, not caseous; mesenteric nodes enlarged; numerous whitish nodules on under surface of diaphragm; anterior mediastinal glands enlarged and caseous.
J18	.....do.....	.....do.....	.....do.....	255	375	.....do.....	Died in 10 hours.....	.....	Moderate hemorrhagic and edematous reaction at site of tuberculin inoculation; excessive fluid in peritoneal cavity; omentum contains few small caseous nodules; spleen bound down; otherwise normal.
J19	.....do.....	.....do.....	.....do.....	280	375	.....do.....	No effect.....	Chloroformed Nov. 13, 1907.	Marked hemorrhagic local reaction; no glandular enlargements; nodules on under surface of diaphragm and in omentum; liver and spleen contain tubercle-like areas.
J20	.....do.....	.....do.....	.....do.....	250	350	.....do.....	Died in 12 hours.....	.....	Hemorrhagic and edematous reaction at site of tuberculin inoculation; inguinal glands, both sides, enlarged and reddened; axillary glands less so; excessive clear fluid in peritoneal cavity; tendency to coagulate; small caseous nodule in abdominal wall at site; omentum rolled up and contains numerous nodules, some caseous; spleen bound down; caseous mass size of pea between spleen and kidney; spleen enlarged and contains four nodules on surface; ileolumbar glands slightly enlarged; under surface of diaphragm roughened with numerous whitish nodules; anterior mediastinal glands enlarged and caseous.

REVIEW OF THE WORK OF OTHERS UPON THE THERMAL DEATH POINT OF THE TUBERCLE BACILLUS.

The early work upon the thermal death point of the tubercle bacillus is clouded in the obscurity of meager data and insufficiently controlled and imperfectly oriented experiments.

Martin,[a] 1882, concludes, from two experiments with fragments of lung of a tuberculous guinea pig, that with an exposure to a moist temperature of 80° C. the infectivity of tubercle bacilli is not lost.

May,[b] 1883, undertook to determine how long the milk of tuberculous cows must be boiled to render it surely innocuous. He experimented with injections of material into the peritoneal cavity of guinea pigs. All the injections of cooked fluids, milk, etc., gave negative results. Most of the experiments with raw milk of tuberculous cows also gave negative results; a few positive. He concludes that there is small danger of infection from raw milk, and none at all from cooked milk, for human beings.

Sormani,[c] 1884, is reported by De Man to have injected milk containing tubercle bacilli into guinea pigs after having heated it ten minutes at 70°, 80°, and 90° C., with the result that all the animals became tuberculous. When, however, the milk was kept seething for five minutes, cooled, and injected, the animals remained sound.

Schill and Fischer,[d] 1884, studied the action of a temperature of 100° C. upon tuberculous sputum. They found that 100° of dry temperature did not surely destroy the virulence of tuberculous sputum whether dry or moist.

Voelsch[e] concluded that boiling did not destroy the virulence in tuberculous products from rabbits, serum cultures, or tuberculous sputum. His experiments were made upon rabbits, and it appears that he misinterpreted the lesions produced by dead tubercle bacilli. He went so far as to believe that boiling twice, while it attenuates, does not destroy the virulence of the tubercle bacillus.

Yersin,[f] 1888, tested the thermal death point of tubercle bacilli "with spores and without spores." The tubercle bacilli "without spores" were obtained from spleen pulp of a rabbit dead of the

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[a] Martin, Hippolyte: Sur la transformation du tubercule vrai ou infectieux en corps étranger inerte sous l'influence de hautes températures et de réactifs divers. Rev. de méd., vol. 2, 1882, p. 913–927.

[b] May, F.: Ueber die Infectiosität der Milch perlsüchtiger Kühe. Arch. f. Hyg., vol. 1, 1883, p. 121.

[c] Sormani: Annali universali di med., vol. 269, 1884.

[d] Schill and Fischer: Ueber die Desinfection des Auswurfs der Phtisiker. Mittheil. a. d. k. Gesndh., vol. 2, 1884, p. 131.

[e] Voelsch: Beiträge zur Frage nach der Tenacität der Tuberkelbacillen. Ziegler & Nauwerk's Beiträge zur path. Anat. u. Phys., vol. 2, 1887.

[f] Yersin, A.: De l'action de quelques antiseptiques et de la chaleur sur le bacille de la tuberculose. Ann. de l'Inst. Pasteur, vol. 2, 1888, p. 60.

intravenous injection of a culture. Some of this spleen pulp, very rich in bacilli, was drawn into capillary tubes hermetically sealed and plunged into a water bath kept at the desired temperature. After heating, the pulp was inoculated upon glycerine bouillon. Tubes heated to 55° for ten minutes gave subsequent growth; those heated to 60° for ten minutes, no growth; those heated to 70° for ten minutes, no growth. The tubercle bacilli "with spores" came from an old culture in glycerin bouillon. Tubes heated to 55° for ten minutes gave subsequent growth; those heated to 60° for ten minutes gave subsequent growth; those heated to 65° for ten minutes, no growth; those heated to 70° for 10 minutes, no growth.

Yersin concludes that the bacillus of tuberculosis resists a temperature of 60° C. for ten minutes, and that it is remarkable that the resistance of the "spores" to the heat is not greater than that of the bacilli themselves. He made no tests upon animals.

He found, contrary to the work of Schill and Fischer, that tuberculous sputum heated to 100° for two minutes is always sterile.

Thus early in the history of these investigations the idea became prevalent that the tubercle bacillus possessed a resistance to heat considerably greater than that of other nonspore-bearing pathogens. Indeed, at this time the tubercle bacillus was regarded by many as occurring in a spore-bearing form, and some of the writers spend much time in telling whether the strains they used were spore-bearing or not, omitting more pertinent facts.

Bitter,[a] 1890, accepted the results of Yersin to the effect that the tubercle bacillus when evenly distributed through milk is killed by an exposure to 75° C. for ten minutes, and inquires if a lower temperature, desirable for practical reasons, might not be equally efficacious. He cautiously descends as far as 68° to 69°, and finds that milk to which infected sputum had been added and placed in test tubes immersed in a previously warmed water bath is rendered innocuous to guinea pigs inoculated intraperitoneally, if the exposure has lasted as much as twenty minutes. Controls injected with the unheated milk died of tuberculosis in five weeks. To be perfectly safe, the author recommends that the exposure to 68°–69° be increased to thirty minutes.

Bang,[b] 1891, states that his experiments demonstrate that heating to 85° C., and sometimes even to 80° C., kills all the tubercle bacilli; that heating for five minutes to 70° C., sometimes to 60° C., so enfee-

[a] Bitter, H.: Versuche über das Pasteurisiren der Milch. Zeit. f. Hyg., vol. 8, 1890, p. 240–286.

[b] Bang: Le danger supposé de la consommation du lait et de la viande sains en apparence mais provenent d'animaux atteints de la tuberculose. Trans. internat. Cong. hyg. et démog., 1890, p. 193. Also: Experimentelle Untersuchungen über tuberculöse Milch. Deut. Zeit. f. Tiermed., vol. 17, 1891, p. 1.

bles the virus that he believes it is no longer able to infect when fed by way of the digestive tract. Ten years later Bang was obliged to correct in part some of his early results.

Many observers nowadays would regard these results as indicating an unduly high resistance of the organism and would suspect that Bang gave the tubercle bacillus a handicap in three ways: (1) In using pathological milk prone to form little clots on heating, which protect the tubercle bacilli (see Barthel and Stenström); (2) in not avoiding the formation of the protective surface pellicle (see Th. Smith, Russell and Hastings, Hesse), and (3) possibly in failing to differentiate the lesions caused by dead tubercle from those caused by living germs (Smith, Miller, Prudden, and Hodenphyl).

Bonhoff,[a] 1892, did not work with milk, but gives some data obtained with pure cultures of tubercle bacilli in liquid media, which may be accepted as contributory evidence. Young cultures, the ultimate antecedents of which are not stated, were exposed in test tubes placed in a water-bath, the temperature being observed on a thermometer placed inside the tube. Guinea pigs were inoculated intraperitoneally before and after exposure. The significant findings are, that while 50° for sixty minutes failed to kill the bacteria, 60° for twenty minutes did kill them. Exposures of less than twenty minutes were not made. The author unfortunately had some difficulty in preventing the development of lung tuberculosis in his animals. For instance, the pigs receiving the material heated to 60° for forty minutes, 70° for sixty minutes, and 80° momentarily, developed what he calls and is at considerable pains to differentiate as *inhalation* tuberculosis.

Grancher and Ledoux-Lebard,[b] 1892, appreciated the occurrence of lesions produced by dead tubercle bacilli in their inoculated animals. They showed that human tubercle bacilli are more sensitive to the action of temperatures of 50° C. than are avian tubercle bacilli. Heating the avian bacilli to 50° or 60° for fifteen minutes did not kill them. Animals inoculated died of tuberculosis. However, the organisms heated to 60° were attenuated. Heating to 70° under the same conditions noted was sufficient to destroy the power of the avian tubercle bacilli to infect laboratory animals.

They heated cultures of human tubercle bacilli suspended in distilled water and found that five minutes at 60° sufficed to attenuate the virulence. Heating to 60° for ten minutes and twenty minutes also greatly attenuated the virulence. When heated to 70° C. for one, two, five, or ten minutes the tubercle bacilli were killed.

[a] Bonhoff: Die Einwirkung höherer Wärmegrade auf Tuberkelbacillen-Reinkulturen. Hyg. Runds., vol. 2, 1892, p. 1009.

[b] Grancher, J., and Ledoux-Lebard: Tuberculose aviaire et humaine. Arch. de méd. expér. et d'anat. pathol., vol. 4, 1892, p. 1.

Forster,[a] 1892, sealed off small glass tubes containing for the most part the milklike material squeezed from the cut surface of tubercular udders and placed these in a water bath kept at the desired temperature for various periods. They were then cooled quickly and injected intraperitoneally into guinea pigs. The presence or absence of living tubercle bacilli was determined by autopsy, by the lesions, or by carrying the suspect material over into other animals. The bacilli appeared not to be killed by three hours exposure to 55°, forty-five minutes exposure to 60°, or momentary exposure to 80°, but were killed by six hours exposure to 55° (sputum), one hour exposure to 60° and 80°, momentary exposure to 95°. These figures indicate a high degree of resistance.

It is difficult to explain the high figures obtained by Forster, especially in the light of the work of Smith, Russell and Hastings and my own.

The next year the same author,[b] reviewing the situation, emphasizes that pasteurizing apparatus is of two kinds; (1) in which the milk passes over heated surfaces and is momentarily raised to a given temperature, and (2) in which the milk is heated in kettles, bottles, etc., and may be kept for a certain time at the desired temperature. He says that the latter are the only ones applicable to milk containing tubercle bacilli, because momentary heating to temperatures insufficient to change the taste of the milk does not kill tubercle bacilli.

De Man,[c] 1893, working under Forster, obtained results long current in text-books and which have been accepted as the standards for practical work in many regulations for dairy methods. The following brief summary of early work on the subject culled by him from Galtier (1879) shows the discrepancies and inadequacies of this period—faults, however, which continue to appear in recent work:

Author.	Temperature.	Time.	Result.
Chaveau and Arloing	70°, 100°	30 minutes	No certainty of killing tubercle bacilli.
Toulssaint	73°, 76°, 80°	(?)	Virulence remains.
Gerlach	100°	30 minutes	Virulence remains, but weakened.
Martin	80°, 100°	(?)	Virus withstands this heat.
Klebs			Boiled milk may cause tuberculosis.
Frerichs, Parrot, and Martin			Boiled tubercular sputum innocuous.
Vallin			Paper impregnated with tubercle bacilli loses virulence by dipping in boiling water.

[a] Forster, J.: Ueber die Einwirkung hoher Temperaturen auf Tuberkelbacillen. Hyg. Runds., vol. 2, 1892, p. 869.

[b] Forster, J.: Ueber die Einwirkung hoher Temperaturen auf Tuberkelbacillen. Hyg. Runds., vol. 3, 1893, p. 669.

[c] De Man, C.: Über die Einwirkung von hoher Temperaturen auf Tuberkelbacillen. Arch. f. Hyg., vol. 18, 1893, p. 133.

De Man states that few, if any, of these authors recite the conditions and methods of their experiments. He used material from the substance scraped from the cut surface of tuberculous udders, and in some instances tubercular sputum. The work was done in the same manner as Forster's, q. v., and is apparently a part of or a continuation of the same series of experiments. His results may be condensed as follows:

Tubercle bacilli are killed by the following temperatures: In udder juice, 55° after four hours exposure, 60° after one hour exposure (not after forty-five minutes), 80° after five minutes exposure, 90° after two minutes exposure, 95° after one minute exposure; in sputum, 65° after fifteen minutes exposure, 70° after ten minutes exposure. Exposure for less time failed to kill. Control animals injected with unheated material became tubercular.

Smith,[a] 1899, says, in criticism of this work, that such dense suspensions can not be used to determine the thermal death point to be compared with those of other bacilli, nor can they be regarded as imitating the conditions under which tubercle bacilli occur in milk. It might be added that De Man's work at two very interesting temperatures (65° and 70°) was performed with sputum and not even udder juice.

Schroeder,[b] 1894, obtained what may be regarded as an early hint that comparatively low temperatures may be effective in killing the tubercle bacillus in milk. With most other observers at that time, he had been led to regard the tubercle bacillus as a nonspore-bearing pathogen almost unique among this class in its resistance to heat. He acted upon the advice of Yersin who, at the suggestion of Roux, attempted to make use of this property to rid milk of those other organisms which frequently produce disease or death when injected into animals. Schroeder, attempting to discover the presence of tubercle bacilli in market milk, heated the specimens to 60° for fifteen minutes before injection. Fortunately, he controlled this procedure with milk artificially inoculated with tubercle bacilli, and the failure to get tuberculosis in market milk specimens was paralleled with a similar failure in the controls. The inference was that 60° for fifteen minutes could, under some circumstances, kill tubercle bacilli.

Woodhead,[c] 1895, obtained very discordant results, which it is difficult to interpret. It is probable that they are explained, in the

[a] Smith, Theobald: The thermal death point of tubercle bacilli in milk and other fluids. Journ. Exper. Med., vol. 4, 1899, p. 217.

[b] Schroeder, E. C.: Further experimental observations on the presence of tubercle bacilli in the milk of cows. U. S. Bur. An. Industry, Bull. 7, 1894, p. 75.

[c] Woodhead, G. Sims: Report of the Royal Commission appointed to inquire into the effect of food derived from tuberculous animals on human health. Parts 8, 9, 12, and 13. 1895.

case of experiments conducted with milk artificially contaminated with pieces of tubercular tissue, by the fact that clumps of considerable size (too large to pass through the inoculating needle and requiring glass pipettes for inoculation) were added to the milk, and that these would in some manner protect the bacilli; and in the case of naturally tuberculous milk by the probability of protection by coagula—especially prone to occur in the concentrated pathological product—and by the pellicle which forms on the surface of heated milk.

Considering the inoculation experiments with both the natural and the artificial tuberculous milk, the following minimum lethal temperature exposures are found in the tables: 50° C. killed surely only after fifteen hours; 55°, after seven hours; 60°, after eight hours; 65°, after four hours;[a] 70°, after forty-five minutes; 75°, after thirty minutes; 80°, —; 85°, after two and one-half minutes; 90° did not kill.

This summary shows how Woodhead's results contradict themselves and differ from those of other observers. When the results with the naturally tuberculous milk alone are considered, the results accord more with Bang's; for example: 60° kills surely after forty-five minutes; 65°, after two and one-half minutes; 70°, after two and one-half minutes.

Marshal,[b] 1899, first sterilized milk, then added tuberculous material from cows, injected control animals with this suspension, and then exposed the milk in shallow dishes in a "pail sterilizer" placed on a water bath. Heat was applied to the water bath until the temperature in all parts of the vapor chamber was 68°. This temperature was maintained twenty minutes. The shallow layer of milk was devised to secure equal temperature throughout the milk. The controls died in a few weeks of tuberculosis, but none of the test animals killed and examined at the same time showed any signs of tuberculosis. He states that from other experience he knows that 60° for ten minutes will not kill tubercle bacilli, but does not detail the experiments upon which this conclusion is based.

Theobald Smith,[c] 1899, contributed an article to the literature of this subject which marks an era in the history of the pasteurization of milk based upon the thermal death point of the tubercle bacillus. Smith's experiments were most carefully performed. Many pitfalls and errors which some of his predecessors had fallen into were avoided and pointed out. The only possible objection to the work, which applies with equal force to all laboratory experiments, is that it was not done on a scale of practical dairy pasteurization.

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[a] No experiment between three and four hours; killed after two hours.

[b] Marshal, Charles E.: Killing the tubercle bacillus in milk. Michigan State Agricultural College experiment station, Bull. 173, 1899.

[c] Smith, Th.: The thermal death point of tubercle bacilli in milk and some other fluids. Journ. Exper. Med., vol. 4, 1899, p. 219.

injected intraperitoneally into guinea pigs. The results are clearly shown in the following tables:

Time exposed.	Result in each series.				
	I.	II.	III.	IV.	V.
60°, 45 minutes	– –				
60°, 30 minutes	– –				
60°, 20 minutes		– –			– –
60°, 15 minutes	– –	– –			– –
60°, 10 minutes		– –	– –	– –	– –
60°, 5 minutes			+ +	+ +	
Control	+	+	+	+	+

– = No tuberculosis.
+ = Tuberculosis.
Two pigs in each experiment.

A series was then run which shows the difference in effect of heating in open vessels and in sealed or closed tubes, the latter being placed in Potts' machine.

Time exposed.	Series VI.		Series VII.	
	Potts' sealed tube.	Open bottle.	Potts' sealed tube.	Open bottle.
60°, 15 minutes				+ +
60°, 10 minutes	– –	+ +	– –	+ +
60°, 5 minutes	+ +	+ +	+ +	
Control	+	+	+	

– = No tuberculosis.
+ = Tuberculosis.
Two pigs in each experiment.

In their experiments, milk heated at 60 degrees began to show visible signs of pellicle after about twenty minutes, but the authors think that flocculent patches exist before this. For practical work they advise pasteurization at 60 degrees for twenty minutes in closed apparatus.

Herr,[a] 1901, worked with cream only. Here the problem is different from that of milk pasteurization. It is not necessary to avoid those temperatures which change the taste of the product, which is used for making butter, and hence a higher temperature and very brief exposure may be employed, permitting the use of the so-called continuous pasteurizers which operate with a great economy of time and fuel. In Herr's experiments cream was shaken up with tuberculous sputum, the mixture sealed off in tubes of 4 c. c. capacity, leaving as little air as possible in the tubes. He had previously determined how long it would take to heat the contents of such

[a] Herr: Das Pasteurisiren des Rahmes als Schutz gegen die Verbreitung der Tuberkelbacillen durch Butter. Zeit. f. Hyg., vol. 38, 1901, p. 182.

tubes to certain temperatures by dropping them into boiling water. The infected tubes were therefore placed in boiling water for the time necessary to heat to the desired temperature and then placed in a water bath maintained at this temperature. After the lapse of the desired time they were cooled rapidly and injected into guinea pigs intraperitoneally. The results are shown in the table, + and − indicating that the animals became tuberculous or not. The results were controlled by examination after the death or killing of the animals.

Temperature and time.	Result.	Temperature and time.	Result.
65°, 15 minutes	−	80°, 3 minutes	−
68°, 15 minutes	−	85°, 5 seconds	−
70°, 7 minutes	−	85°, 5 minutes	−
72°, 7 minutes	−	89°, 30 seconds	−
75°, 3 minutes	−	90°, 5 seconds	−
75°, 5 minutes	(a)	95°, 5 seconds	−
80°, 5 seconds	+		

a Pseudo-tubercle, Pfeiffer.

As the most practical temperature and exposure, Herr recommends 85° for two minutes for cream from which butter is to be made. This is obtained in the "continuous" form of apparatus.

Hesse,[a] 1901, corroborates Smith's findings. Sterilized milk inoculated with a culture of human tubercle bacilli several weeks old was sealed off in small tubes and these dropped into a Pfund's sterilizer previously heated. After twenty minutes exposure they were taken out and cooled and the contents injected into guinea pigs. The animals were killed after fifty-five days. Controls receiving unheated milk had high-grade generalized tuberculosis. Pigs receiving milk heated at 57° for twenty minutes had less severe lesions; those receiving milk heated at 58° for twenty minutes had still severe lesions, and one receiving milk heated at 60° for twenty minutes was entirely sound, the other having a small translucent nodule in the diaphragm, in which no tubercle bacilli were found.

The experiments corroborate Smith's findings. The gradation of severity of lesions inversely with the increased temperature is interesting.

Levy and Bruns,[b] 1901, showed that a temperature varying between 65° and 70° C. and operating for fifteen to twenty-five minutes effectually killed bovine and human tubercle bacilli in milk, when 1 liter of the artificially infected milk was exposed in a d'Arsonval

a Hesse: Ueber die Abtödtung der Tuberkelbacillen in 60° C. warmer Milch. Zeit. Tiermed., 1901, vol. 5, p. 5–6.

b Levy, E., and Bruns, Hugo: Ueber die Abtödtung der Tuberkelbacillen in der Milch durch Einwirkung von Temperaturen unter 100°. Hyg. Runds., vol. 11, 1901, p. 669.

thermostat—i. e., under conditions where a pellicle would not be formed. The work is interesting especially because a liter of milk was used in the experiments. It is to be regretted that they did not experiment with lower temperatures.

Barthel and Stenström,[a] 1901, report some preliminary work which must be interpreted as showing the influence of coagula in protecting the tubercle bacilli from the action of heat. This clot formation was probably due to the abnormal reaction of the pathological fluid from tuberculous udders employed. Animals injected with this material became tuberculous after it had been heated to 75° for fifteen minutes and 80° for ten minutes. Temperatures and exposures sufficient to kill the tubercle bacilli under the conditions of the experiments were not employed. In this connection the subsequent work of these authors should be consulted (vide infra).

Bang,[b] 1902, reported a large number of experiments which give results at variance with those of this author's former investigations. To avoid the formation of the surface pellicle and foam, in some of his work he exposed the milk in closed metallic boxes containing a thermometer immersed in a water bath and kept constantly in motion during the exposure to insure an equal distribution of the heat. As in former work, he used rabbits to test the virulence of exposed material by the intraperitoneal method. He experimented with pure cultures of the bacillus, noting whether growth was delayed or inhibited by exposure to heat, and further determined the effect of feeding the heated milk to rabbits and swine. The essential features of his results (under conditions which prevent the formation of scum) are as follows:

Temperature and exposure.	Result.
60°, 15 minutes	Prevented tuberculosis in 2 animals, but 2 others became slightly tuberculous.
65°, 1 to 15 minutes	Effectually prevented tuberculosis.
70°, 75°, 80°, and 85°, momentarily	Do.

Tuberculous milk from diseased udders was used in some of these experiments.

Rabbits receiving one 30 c. c. feeding of milk exposed for two minutes to 60°, 65°, 70°, 75°, 80°, and 85° remained free from tubercle, although controls fed with raw milk became tuberculous.

Swine fed with 150 c. c. each of tuberculous milk heated for half a minute at 60° became tuberculous, while those receiving milk heated to 70°, 75°, and 80° for half a minute remained sound.

[a] Barthel, Chr., and Stenström, O.: Beitrag zur Frage des Einflusses hoher Temperaturen auf Tuberkelbacillen. Cent. f. Bakt., vol. 30, 1901, p. 429.

[b] Bang: Ueber die Abtödtung der Tuberkelbacillen bei Wärme. Zeit. f. Tiermed., *vol. 6*, 1902, p. 81.

From these results Bang concludes that while heating at 60° for fifteen minutes does not prevent peritoneal infection it weakens the bacteria so that they are innocuous by way of the alimentary tract.

Concerning his work with cultures, it is interesting to note that glycerin-bouillon tubes sowed with particles of growth from a young culture failed to develop any growth after exposure to 60° and 65° for five minutes, although unheated controls grew well.

Bang did not report results at 60° for twenty minutes.

Tjaden,[a] 1903, obtained very high thermal death points for the tubercle bacillus and concludes that 85° for one to two minutes is necessary to kill that organism. Bang attributes this high resistance to the coagula which formed during some of the experiments.

Rullmann,[b] 1903, in a preliminary note, says that he can not agree with those observers who state that 60° for fifteen or twenty minutes kills the tubercle bacilli in milk. He found that milk infected with tuberculous sputum exposed to 65° for half an hour "with all precautions" still caused tuberculosis when injected intraperitoneally into guinea pigs. He promises a full report, which, however, we have not been able to obtain.

Barthel and Stenström,[c] 1904, continue their experiments relative to the effect of the reaction of milk upon the resistance to heat of the contained tubercle bacilli. They divided into two portions some tuberculous milk; one portion was rendered abnormally acid, another neutral in reaction. The neutral milk withstood 90° without coagulation; the acid milk coagulated at 60°.

Results with 80°: One minute exposure killed in uncoagulated milk, but not in coagulated, i. e., acid milk.

At 85°: Momentary exposure failed to kill in either. One minute exposure killed in uncoagulated but not in coagulated milk.

While these experiments are very limited in scope, they at least suggest a source of error in the work of those who used the secretion of tubercular udders in their experiments. Such material is prone to be abnormal in reaction, and protective clots may have been formed.

Sydney Phillips,[d] 1904, mentions merely that the results obtained by Russell and Hastings[e] were confirmed by Macfadyean of the Lister Institute.

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[a] Tjaden: Abtödtung der pathogenen Keime in der Molkereimilch durch Erhitzung ohne Schâdigung der Milch und Milchproducte. Deut. Med. Woch., 1903, p. 976.

[b] Rullman: Ueber die Abtödtung von Tuberkelbacillen in erhitzer Milch. Münch. med. Woch., 1903, vol. 31, p. 1342.

[c] Barthel, Chr., and Stenström, O.: Weitere Beiträge zur Frage des Einflusses hoher Temperaturen auf Tuberkelbacillen in der Milch. Cent. f. Bakt., vol. 37, 1904, p. 459.

[d] Phillips, Sydney: The milk supply of a hospital; American method of sterilization. The Hospital, July 16, 1904.

[e] Russell and Hastings. University of Wisconsin Agricultural Experiment Station, 17th Ann. Rep., 1900.

Russell and Hastings,[a] 1904, had worked previously from the standpoint of a comparatively low temperature, 60° C. They now worked from the standpoint of a short exposure, such, for instance, as is available in a continuous-action pasteurizing machine, to determine how low a temperature could be safely used with such necessarily short exposures. Milk infected with human and bovine cultures of known origin and virulence was exposed in sealed glass tubes placed in a water bath. It took three-fourths of a minute for the contained milk to reach the temperature of the outside water. Virulence was determined upon guinea pigs by the intraperitoneal method.

Their results show that material exposed to 160° F. (71.1° C.) for one minute was freed of living tubercle bacilli. This applied to a very virulent bovine strain as well as to less virulent bovine and human strains. The authors conclude that 71.1° C. or more for a period of one minute suffices to destroy the virulence of bovine tubercle cultures so that the disease is not produced in guinea pigs inoculated with amounts of the cultures ranging from 2 to 5 milligrams. As definite amounts of the culture had been added to the milk, the dosage of each animal could be approximated. It is fair to note that the virulent bovine strain produced lesions in animals receiving the heated milk, which, however, were justly regarded by the authors as being due to dead bacteria, since animals inoculated with this material failed to develop tuberculosis. The authors do not unreservedly recommend this temperature and exposure for routine practical pasteurization without further investigation under all conditions.

Schwellengroebel,[b] 1904, shows that when milk is pasteurized in bottles the tubercle bacilli, if present, may be protected against the heat by (1) the rough or cracked surface of the rubber washers used by some dairymen in closing the bottles, (2) the dried layer of milk in improperly cleansed bottles, (3) the pellicle formed on the surface of heated milk, and (4) the foam formed in the same way. The remedies are, of course, sterilization of bottles, washers, etc., and heating under conditions which prevent the formation of foam and pellicle.

Zelenski,[c] 1906, is a recent advocate of higher temperatures in the pasteurization of milk. He finds that 76° for ten, fifteen, or twenty minutes is insufficient to kill the bacilli.

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[a] Russell, H. L., and Hastings, E. G.: Effects of short periods of exposure to heat on tubercle bacilli in milk. University of Wisconsin Agricultural Experiment Station, 21st Ann. Rep., 1904, p. 178.

[b] Schwellengröbel, M.: Ueber das Pasteurisiren der Milch. Cent. f. Bakt., Abt. 2, vol. 12, 1904, p. 440.

[c] Zelenski: Zur Frage der Pasteurisation der Säuglingsmilch. Jahrb. f. Kinderheilkunde, 1906, vol. 63, 3, p. 288.

It is difficult, if not impossible, to briefly summarize the above work. The following table necessarily leaves out many factors:

TABLE No. 12.—*Showing the thermal death point of the tubercle bacillus as found by various investigators.*

Investigator.	Killed at—	Not killed at—
Martin, 1882		80°.
May, 1883	By cooking	
Sormani, 1884	Boiling, 5 minutes	90° for 10 minutes.
Schill and Fisher, 1884		100°.
Voelsch, 1887		100°, boiling twice.
Yersin, 1888	60°, 10 minutes (−spores) 60°, 10 minutes (+spores)	
Bitter, 1890	68°, 20 minutes	
Bang, 1891	70°, 5 minutes (enfeebles) 60°, 5 minutes (sometimes enfeebles) 80° (sometimes kills) 85° (always kills)	
Bonhoff, 1892	60°, 20 minutes	50°, 60 minutes.
Grancher and Ledeux-Lebard, 1892	60°, 5 minutes (attenuates) 70°, 1 minute (kills)	
Forster, 1892	60°, 6 hours 95°, momentary	55°, 3 hours. 60°, 45 minutes. 80°, momentary.
De Man, 1893	55°, 4 hours 60°, 1 hour	60°, 45 minutes.
Schroeder, 1894	60°, 15 minutes	
Woodhead, 1895	50°, 15 hours 60°, 8 hours 60°, 45 minutes 70°, 45 minutes 70°, 2½ minutes	90° (results contradictory).
Marshall, 1899	68°, 20 minutes	60°, 10 minutes.
Th. Smith, 1899	60°, 15 to 20 minutes	
Morgenroth, 1900	55°, 3 hours	70°, 10 minutes. 100°, momentary.
Kobrak, 1900	50°, 4 hours	
Beck, 1900	100°, 3 hours	100° 80°, 30 minutes.
Galtier, 1900		85°, 6 minutes.
Russell and Hastings, 1900	60°, 20 minutes	
Herr, 1901	65°, 15 minutes	80°, 5 seconds.
Hesse, 1901	60°, 20 minutes	
Levy and Bruns, 1901	65°, 15 minutes	
Barthel and Stenström, 1901		70°, 15 minutes.
Bang, 1902		60°, 15 minutes.
Tjaden, 1903	85°, 1 to 2 minutes	
Rullmann, 1903	65°, 30 minutes	60°, 20 minutes.
Barthel and Stenström, 1904	80°, 1 minute (uncoagulated)	80°, 1 minute (coagulated).
Russell and Hastings, 1904	71°, 1 minute	
Zelenski, 1906		76°, 20 minutes.
Rosenau, 1907	60°, 20 minutes	

The above tabular statement shows that my results agree with the work of Yersin, Bonhoff, Schroeder, Th. Smith, Russell and Hastings, and Hesse in that 60° for twenty minutes is sufficient to kill the tubercle bacillus.

BACILLUS TYPHOSUS.

REVIEW OF THE WORK OF OTHERS.

Sternberg,[a] 1888, found that the temperature of 56° C. (138.8° F.) for ten minutes killed the Bacillus *typhi abdominalis*. Sternberg adopted ten minutes as the standard time of exposure for his experimental work upon the thermal death point of a long list of micro-organisms. He took pains to insure uniform temperature by personal attention and frequent stirring of the water bath with a glass rod. The micro-organisms were first drawn into hermetically sealed capillary tubes with expanded extremities. The tubes were immersed in a water bath, maintained at the desired temperature, for the standard time, namely, ten minutes. No attempt was made to fix the thermal death point within narrower limits than 2° C.

Pfuhl,[b] 1888, placed a number of test tubes containing a bouillon culture of typhoid bacilli with spores (?) in water baths at 50° and 60° C. for ten, twenty, thirty, and fifty minutes. All the 50° cultures retained life and motility. In the 60° bath only those exposed ten minutes regularly showed movement and growth.

Van Geuns,[c] 1889, determined the effect upon bacteria of momentary heating to temperatures varying from 50° to 80° C. and immediate cooling. He used four methods:

Method 1: Stock-broth culture of the organism was introduced into 10 per cent gelatin tubes with a platinum loop. Some of these inoculated tubes were incubated as controls and the others placed in a water bath kept at a constant temperature. The control with thermometer in a gelatin tube showed that it took ninety seconds to reach 80° C. and that it took about the same time to cool the tube in tap water to 12° C. After heating, the gelatin tubes were incubated at 20°. This was the first method used by Van Geuns for a study of the common organisms in milk.

For special purposes he adopted one of the following methods:

Method 2: Capillary pipettes were filled with broth cultures. The capillary tube was inserted into a cork along with a thermometer and both immersed into a test tube of water, which in turn rested in a water bath at boiling temperature. As soon as the required temperature in the tube was reached it was removed from the bath and cooled. The capillary tube was then broken, and, with a needle, stabs were made in gelatin.

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[a] Sternberg, Manual of Bacteriology, 1892, p. 146, and Report of the Committee on Disinfectants of the American Public Health Association. 1888, pp. 136 and 152 (p. 140).

[b] Pfuhl: Zur Sporenbildung der Typhusbacillen. Cent. f. Bakt., vol. 4, 1888, p. 771.

[c] Van Geuns: Über das Pasteurisiren von Bakterien. Ein Beiträgé zur Biologie der Microorganismen. Arch. f. Hyg., vol. 9, 1889, p. 369.

Method 3: This is a modification of method No. 1. The test tube, containing broth or water, with a thermometer and capillary tube, is put into a water bath kept at temperature of the tube tested, or 3 to 5 degrees higher.

Method 4: Capillary tubes and the thermometer placed in a small Erlenmyer flask, which can be well shaken. The fluid in the flask was accurately maintained at a constant temperature by placing the flask in a small water bath, which, in turn, was placed in a larger one and a thermoregulator used to control the temperature of the outer bath.

Van Geuns concluded that the thermal death points based on the above experiments were as follows:

Time required to reach temperature stated.	Cholera. (°C.)	Typhoid. (°C.)
1 minute	59	60
5 minutes	54	56

Lazarus,[a] 1890, used 20 liters of raw market milk divided into small flasks; these he inoculated with cholera and typhoid. This infected milk was then run through a small Thiel's continuous pasteurizer at the rate of 1 liter per forty seconds. The temperatures were made to vary from 60° to 96° C. in the different experiments. At intervals of one to two minutes samples of one-half cubic centimeter were taken and plated on fluid gelatin. At 70° C. living typhoid and cholera were found, but none at 75° C. These results are more a test of the efficiency of this particular pasteurizer than an accurate determination of the thermal death points of the micro-organisms used.

Janowski,[b] 1890, inoculated typhoid bacilli from a four-day potato growth into gelatin after it reached the temperature to be tested. At the end of five or ten minutes roll tubes were made. He found those exposed 57° for five minutes always remained sterile. Sometimes he got a growth at 56° for five minutes, and once at 56° for ten minutes. The bacilli were not put into the gelatin until it reached the temperature to be tested, and the work therefore does not exactly imitate the conditions of pasteurization.

Neisser,[c] 1895, used the same methods as von Geuns. The temperature was taken from a control tube and the time counted from the moment the temperature reached the desired degree. Some typhoid bacilli resisted three minutes' heating at 60° to 61.75° C., but fifteen minutes' heating at this temperature killed all.

[a] Lazarus, A.: Die gebräuchlicheren Mittel zur Conservirung der Milch. Zeit. f. Hyg., vol. 8, 1890, p. 235.

[b] Janowski: Zur Biologie der Typhusbacillen. Cent. f. Bakt., vol. 8, 1890, p. 167.

[c] Neisser, Max: Dampf-Desinfection und Sterilisation von Brunnen und Bohrlöchern. Zeit. f. Hyg., vol. 20, 1905, p. 308.

Hesse,[a] 1900, obtained sterile milk directly from the cow by the use of special precautions in test tubes, and inoculated these tubes with cultures of typhoid, cholera, diphtheria, and plague. They were heated to 60° C. for fifteen to twenty minutes in a water bath and plated. The plates remained sterile. Controls gave a good growth. No record is given of the effect of lower temperatures or shorter times. The possible effects of the "germicidal" power of the raw milk was not considered.

Bassenge,[b] 1903, made about fifty-two determinations of the effect of various temperatures upon typhoid in raw milk. He used large quantities of raw milk—one-half to 1½ liters—to which had been added a broth culture tube of typhoid. The work was done in iron, porcelain, and enamel-ware vessels, over gas and coal flames of varying intensity. The milk was raised from room temperature to the desired point. Bassenge found that when milk was raised to a temperature of 60° C. in from five to ten minutes and plates made on Conradi-Drigalski medium no typhoid was found. When, however, the milk was raised to 60° C. in three minutes, typhoid colonies were present. He does not indicate whether the degrees reported were top or bottom temperatures. His figures varied slightly, depending upon the composition of the vessel in which the milk was heated.

Friedel, Kutscher, and Meinicke,[c] 1904, working in Koch's laboratory under Kolle's direction, found that the typhoid, paratyphoid, and enteritidis group of bacilli have the same resistance to heat. They were all killed without exception when the temperature of the milk reached 59° C., provided ten minutes elapsed from the beginning of the heating until this temperature was reached.

These experiments were made by previously heating one-half to 1 liter of milk to 100° in an Erlenmeyer flask and after this cooled inoculating it with 10 c. c. of a fresh twenty-four hour bouillon culture. The flasks were then set in a large kettle of hot water and precautions taken to obtain an equable distribution of heat. It required ten minutes to heat this quantity of milk from 15° to 60° C. At intervals of one minute 5 c. c. were taken with a sterile pipette and added to 50 c. c. of bouillon, incubated twenty-four hours, and then plated upon agar.

A review of the literature upon the viability of the typhoid bacillus, with especial reference to its thermal death point, will be found in Hyg. Rundschau, vol. 14, 1904, p. 353, by Ina Rosquit, and Zeit. f. Hyg., vol. 20, 1895, p. 308, by Max Neisser.

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[a] Hesse, W.: Ueber das Verhalten pathogenen Mikroorganismen in pasteurisirter Milch. Zeit. f. Hyg., vol. 34, 1900, p. 346.

[b] Bassenge, R.: Ueber das Verhalten der Typhusbazillen in der Milch und deren Produkten. Deut. med. Woch., vol. 29, 1903, p. 264.

[c] Friedel, Kutscher, and Meinicke: Die Widerstandfähigkeit der Erreger der wichtigsten Darmkrankheiten gegen Erwärmen auf verschiedene Temperaturen in *Milch.* Klin. Jahrb., vol. 13, 1904–5, p. 324.

ORIGINAL EXPERIMENTS.

In the following work I used nine different strains of typhoid bacilli. The results were as follows:

EXPERIMENT No. 1.

B. typhosus.

Forty-eight hours' growth in sterilized milk. Milk immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	Loop of milk culture in bouillon.
"Dawson" culture; reaction, 0.216 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
4 minutes after immersion	60	No growth.
5 minutes after immersion	(a)	Do.
"P. I." culture; reaction, 0.207 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
4 minutes after immersion	60	No growth.
5 minutes after immersion	(a)	Growth.[b]
"P. I." culture; reaction, 0.198 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	No growth.
4 minutes after immersion	60	Do.
5 minutes after immersion	(a)	Do.
"McF." culture; reaction, 0.225 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.[c]
4 minutes after immersion	60	No growth.
5 minutes after immersion	(a)	Do.
"Smith" culture; reaction, 0.198 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
4 minutes after immersion	60	No growth.
5 minutes after immersion	(a)	Do.
'Hay" culture; reaction, 0.234 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
4 minutes after immersion	60	No growth.
5 minutes after immersion	(a)	Do.
"Stock" culture; reaction, 0.171 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	No growth.
4 minutes after immersion	60	Do.
5 minutes after immersion	(a)	Do.

[a] One minute at 60°. [b] Contaminated. [c] Delayed.

EXPERIMENT No. 1—Continued.

Milk culture.	Temperature (°C.).	Loop of milk culture in bouillon
"Chicago" culture; reaction, 0.225 per cent acid:		
At start	29	Growth.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	No growth.
4 minutes after immersion	60	Do.
5 minutes after immersion	(a)	Do.

a One minute at 60°.

EXPERIMENT No. 2.

B. typhosus.

Culture, "Hopkins;" forty-eight hours' growth in sterilized milk. Reaction, 0 per cent acid.

The milk at 31.5° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number colonies per loop in agar
At start	31.5	Growth	70
1½ minutes after immersion	55	do	25
1¾ minutes after immersion	56		
1⅞ minutes after immersion	57	Growth	10
2¼ minutes after immersion	58	do	1
2½ minutes after immersion	59	do	
3¾ minutes after immersion	60	No growth	
4¾ minutes after immersion	1 minute at 60	do	No
5¾ minutes after immersion	2 minutes at 60	do	No
5¾ minutes after immersion	3 minutes at 60	do	No
6¾ minutes after immersion	4 minutes at 60	do	No
7¾ minutes after immersion	5 minutes at 60	do	No

EXPERIMENT No. 3.

B. typhosus.

Culture, "P. I.;" forty-eight hours' growth in sterilized milk. Reaction, 0.198 per cent acid.

Milk at 29° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number colonies per loop in agar
At start	29	Growth	(a)
1½ minutes after immersion	55	do	
2½ minutes after immersion	58	No growth	Lo
4 minutes after immersion	60	do	No
5 minutes after immersion	1 minute at 60	do	No

a Innumerable.

EXPERIMENT NO. 4.

B. typhosus.

Culture, "Hopkins;" twenty-four hours' growth in sterilized milk. Reaction, 0.27 per cent acid.

The milk at 27° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number of colonies per loop in agar.
At start	27	Growth	[a] 40,000
1 minute after immersion	50	do	[a] 40,800
1½ minutes after immersion	55	do	[a] 40,600
2½ minutes after immersion	58	do	2,400
2¾ minutes after immersion	59	do	360
4 minutes after immersion	60	do	12
6 minutes after immersion	2 minutes at 60	No growth	None.
8 minutes after immersion	4 minutes at 60	do	None.
10 minutes after immersion	6 minutes at 60	do	None.
12 minutes after immersion	8 minutes at 60	do	None.
14 minutes after immersion	10 minutes at 60	do	None.

[a] About.

EXPERIMENT NO. 5.

B. typhosus.

Twenty-four hours' growth in sterilized milk. Milk at 28° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.
"Stock" culture; reaction, 0.162 per cent acid:		
At start	28	Growth.
2½ minutes after immersion	58	No growth.
3 minutes after immersion	59	Do.
4 minutes after immersion	60	Do.
5 minutes after immersion	1 minute at 60	Do.
6 minutes after immersion	2 minutes at 60	Do.
"Hay" culture; reaction, 0.126 per cent acid:		
At start	28	Growth.
2½ minutes after immersion	58	No growth.
3 minutes after immersion	59	Do.
4 minutes after immersion	60	Do.
5 minutes after immersion	1 minute at 60	Do.
6 minutes after immersion	2 minutes at 60	Do.

EXPERIMENT No. 6.

B. typhosus.

Culture, "Hay;" forty-eight hours' growth in sterilized milk. Reaction, 0.162 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
1¾ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
3½ minutes after immersion	60	Do.
4½ minutes after immersion	1 minute at 60	No growth.
5½ minutes after immersion	2 minutes at 60	Do.
6½ minutes after immersion	3 minutes at 60	Do.
7½ minutes after immersion	4 minutes at 60	Do.
8½ minutes after immersion	5 minutes at 60	Do.

EXPERIMENT No. 7.

B. typhosus.

Culture, "Chicago;" forty-eight hours' growth in sterilized milk. Reaction, 0.171 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
1¾ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
2¾ minutes after immersion	60	Do.
3¾ minutes after immersion	1 minute at 60	No growth.
4¾ minutes after immersion	2 minutes at 60	Do.
5¾ minutes after immersion	3 minutes at 60	Do.
6¾ minutes after immersion	4 minutes at 60	Do.
7¾ minutes after immersion	5 minutes at 60	Do.

EXPERIMENT No. 8.

B. typhosus.

Culture, "Hopkins;" forty-eight hours' growth in sterilized milk. Reaction, 0.153 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
1¾ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
2¾ minutes after immersion	60	Do.
3¾ minutes after immersion	1 minute at 60	Do.

EXPERIMENT No. 8—Continued.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
4½ minutes after immersion	2 minutes at 60	No growth.
5½ minutes after immersion	3 minutes at 60	Do.
6½ minutes after immersion	4 minutes at 60	Do.
7½ minutes after immersion	5 minutes at 60	Do.

EXPERIMENT No. 9.

B. typhosus.

Culture, "P. I.;" forty-eight hours' growth in sterilized milk. Reaction, 0.153 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
3½ minutes after immersion	60	No growth.
4½ minutes after immersion	1 minute at 60	Do.
5½ minutes after immersion	2 minutes at 60	Do.
6½ minutes after immersion	3 minutes at 60	Do.
7½ minutes after immersion	4 minutes at 60	Do.
8½ minutes after immersion	5 minutes at 60	Do.

EXPERIMENT No. 10.

B. typhosus.

Culture, "Smith;" forty-eight hours' growth in sterilized milk. Reaction, 0.162 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
1½ minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
3½ minutes after immersion	60	Do.
4½ minutes after immersion	1 minute at 60	No growth.
5½ minutes after immersion	2 minutes at 60	Do.
6½ minutes after immersion	3 minutes at 60	Do.
7½ minutes after immersion	4 minutes at 60	Do.
8½ minutes after immersion	5 minutes at 60	Do.

EXPERIMENT No. 11.

B. typhosus.

Culture, "Hopkins;" forty-eight hours' growth in whole milk that had been sterilized by the fractional process three days. Reaction, 0.252 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	1 c. c. milk culture in bouillon.
At start	21	Growth.
2 minutes after immersion	55	Do.
2½ minutes after immersion	57	Do.
3 minutes after immersion	59	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	No growth.
6½ minutes after immersion	2 minutes at 60	Do.
7½ minutes after immersion	3 minutes at 60	Do.
9½ minutes after immersion	5 minutes at 60	Do.
14½ minutes after immersion	10 minutes at 60	Do.

EXPERIMENT No. 12.

B. typhosus.

Culture, "P. I.;" forty-eight hours' growth in whole milk that had been sterilized by the fractional process three days. Reaction, 0.288 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.)	1 c. c. milk culture in bouillon.
At start	21	Growth.
1½ minutes after immersion	55	Do.
2 minutes after immersion	57	Do.
2½ minutes after immersion	59	Do.
3½ minutes after immersion	60	Do.
4½ minutes after immersion	1 minute at 60	No growth.
5½ minutes after immersion	2 minutes at 60	Do.
6½ minutes after immersion	3 minutes at 60	Do.
8½ minutes after immersion	5 minutes at 60	Do.
13½ minutes after immersion	10 minutes at 60	Do.

Conclusion.—The evidence is plain that milk heated to 60° C. and maintained at that point for two minutes will kill the typhoid bacillus. The great majority of these organisms are killed by the time the temperature reaches 59° C. and few survive to 60° C.

BACILLUS DIPHTHERIÆ.

REVIEW OF THE WORK OF OTHERS.

Welch and Abbott,[a] 1891, tested the thermal death point of the diphtheria bacillus upon bouillon cultures and suspensions, in sterlized salt solution, in capillary glass tubes, and found that the bacillus

[a] Welch and Abbott: The etiology of diphtheria. Johns Hopkins Hospital Bull., vol. 2, 1892.

is killed at a temperature of 58° C. in ten minutes. Details not stated.

Sternberg,[a] 1892, quotes Löffler to the effect that the thermal death point of the bacillus of diphtheria is 60° C.

ORIGINAL EXPERIMENTS.

In my work I used Park's bacillus No. 8, which is a strong toxine producer and virulent for laboratory animals. My results follow:

EXPERIMENT No. 13.

B. diphtheriæ.

Culture, "Park, No. 8;" twenty-four hours growth in sterilized milk. Reaction of milk, 0.108 per cent acid.

The milk at 32° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number of colonies per loop in glycerin agar.
At start	32	Growth	1,240
2 minutes after immersion	50	No growth	None.
2½ minutes after immersion	57	do	None.
3½ minutes after immersion	59	do	None.
4½ minutes after immersion	60	do	None.
5½ minutes after immersion	1 minute at 60	do	None.

EXPERIMENT No. 14.

B. diphtheriæ.

Culture, "Park, No. 8;" twenty-four hours growth in sterilized milk. Reaction of milk, 0.108 per cent acid.

The milk at 31.5° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number of colonies per loop in glycerin agar.
At start	31.5	Growth	1,800
1½ minutes after immersion	55	No growth	None.
2 minutes after immersion	57	do	None.
2½ minutes after immersion	59	do	None.
3 minutes after immersion	60	do	None.
4 minutes after immersion	1 minute at 60	do	None.

[a] Sternberg: Manual of bacteriology, 1892, p. 148; also, American Public Health Association, committee on disinfectants, p. 152.

Experiment No. 15.

B. diphtheriæ.

Culture, "Park"; forty-eight hours' growth in sterilized milk. Reaction, 0.153 per cent acid.

The milk at 28° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number of colonies per loop in agar.
At start	28	Growth	3,150
1½ minutes after immersion	45	.....do	1,890
1½ minutes after immersion	48	.....do.[a]	[b]19
1¾ minutes after immersion	50	.....do.[a]	26
2 minutes after immersion	51	No growth	None.
2¼ minutes after immersion	52	.....do	None.
2½ minutes after immersion	53	.....do	None.
2¾ minutes after immersion	54	.....do	None.
3½ minutes after immersion	55	.....do	None.

[a] Delayed. [b] Contaminated.

Experiment No. 16.

B. diphtheriæ.

Culture, "Park, No. 8;" fifty-two hours' growth in sterilized milk.

Milk at 28° C. immersed in constant-temperature water bath at 60° C.

Three test-tube cultures tested by planting a loop over into bouillon.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.		
		Reaction, 0.171 per cent acid.	Reaction, 0.135 per cent acid.	Reaction, 0.135 per cent acid.
At start	28.5	Growth	Growth	Growth.
1½ minutes after immersion	50	No growth		
2½ minutes after immersion	55	.....do	No growth	No growth.
2¾ minutes after immersion	58	.....do	.....do	Do.
4½ minutes after immersion	60	.....do	.....do	Do.
5½ minutes after immersion	(a)	.....do	.....do	Do.

[a] One minute at 60°.

EXPERIMENT No. 17.

B. diphtheriæ.

Culture, "Park, No. 8;" forty-eight hours' growth in sterilized milk. Reaction of milk, 0.162 per cent acid.

The milk at 25° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (°C.).	Loop of milk culture in bouillon.
At start	25	Growth.
1½ minutes after immersion	45	Do.
2 minutes after immersion	50	No growth.
2½ minutes after immersion	51	Do.
2½ minutes after immersion	52	Do.
2¾ minutes after immersion	53	Do.
3 minutes after immersion	54	Do.
3¾ minutes after immersion	55	Do.
4¾ minutes after immersion	1 minute at 55	Do.
5¾ minutes after immersion	2 minutes at 55	Do.
6¾ minutes after immersion	3 minutes at 55	Do.

EXPERIMENT No. 18.

B. diphtheriæ.

Culture, "Park, No. 8;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.135 per cent acid.

The milk at 30° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (°C.).	About ¼ c. c. of milk culture into bouillon.	Loop of milk culture in in bullion.
At start	30	Growth	Growth.
1½ minutes after immersion	45	do	Do.
1½ minutes after immersion	48	do	Growth, delayed.
1¾ minutes after immersion	50	do	Growth, small, delayed.
2 minutes after immersion	51	do	Growth, delayed.
2½ minutes after immersion	52	do	Growth, small, delayed.
2¾ minutes after immersion	53	do	No growth.
4 minutes after immersion	54	Growth, delayed.	Do.
5¾ minutes after immersion	55	do	Do.

This experiment demonstrates the different results obtained by carrying over large and small quantities of the test fluid.

EXPERIMENT No. 19.

B. diphtheriae.

Culture, "Park;" forty-eight hours' growth in sterilized milk. Reaction, 0.09 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	45	Do.
1½ minutes after immersion	50	Do.
1¾ minutes after immersion	53	Do.
2¼ minutes after immersion	55	Do.
2½ minutes after immersion	56	Do.
2¾ minutes after immersion	58	Growth, small.
4 minutes after immersion	60	Do.
5 minutes after immersion	1 minute at 60	No growth.
6 minutes after immersion	2 minutes at 60	Do.

EXPERIMENT No. 20.

B. diphtheriae.

Culture, "Park, No. 8;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.18 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	0.5 c. c. milk culture in bouillon.
At start	24	Growth.
1¼ minutes after immersion	45	Do.
1½ minutes after immersion	50	Do.
2 minutes after immersion	55	Do.
2½ minutes after immersion	57	No growth.
3 minutes after immersion	58	Do.
3½ minutes after immersion	59	Do.
4¾ minutes after immersion	60	Do.
5¾ minutes after immersion	1 minute at 60	Do.
6¾ minutes after immersion	2 minutes at 60	Do.

EXPERIMENT No. 21.

B. diphtheriae.

Culture, "Park, No. 8;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.18 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	0.5 c. c. milk culture in bouillon.
At start	24	Growth.
1¼ minutes after immersion	45	Do.
1¾ minutes after immersion	50	Do.
2¼ minutes after immersion	55	Do.
2¾ minutes after immersion	57	No growth.
3¼ minutes after immersion	58	Do.
4 minutes after immersion	59	Do.
5½ minutes after immersion	60	Do.
6½ minutes after immersion	60.4	Do.
7½ minutes after immersion	60.5	Do.

EXPERIMENT No. 22.

B. diphtheriae.

Culture, "Park, No. 8;" forty-eight hours' growth in whole milk that had been sterilized by the fractional method three days. Reaction, 0.216 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	1 c. c. milk culture in bouillon.
At start	21	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	53	Do.
2½ minutes after immersion	55	No growth.
2¾ minutes after immersion	57	Do.
3¾ minutes after immersion	59	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.

Conclusion.—The diphtheria bacilli succumb at comparatively low temperatures. Oftentimes they fail to grow after heating to 55° C. Some occasionally survive until the milk reaches 60° C.

On account of its acid reaction milk is not a suitable medium for cholera.

Van Geuns,[a] 1889, showed that 59° C. for one minute, or 54° for five minutes, was ample to kill Koch's comma bacillus.

Sternberg,[b] 1888, found that a temperature of 52° C. (125.6° F.) was sufficient to kill the *Spirillum choleræ Asiaticæ*. For details of Sternberg's technique see page 48.

Kitasato,[c] 1889, tested the thermal death point of the cholera bacillus in gelatin and found that it required 60° C. for ten minutes to kill this organism with certainty, although sometimes it dies at 50° for fifteen minutes or 55° for ten minutes. Kitasato used eight different cultures and made a number of experiments, the results of which are brought together in the following table:

	I.	III.	VI.	VIII.	IX.	X.	XII.	XIV.
50° C., 5 minutes	+	+	+	+	+	+	+	+
50° C., 10 minutes	+	+	+	+	+	+	+	+
50° C., 15 minutes	+	+	+	+	−	+	−	−
55° C., 5 minutes	+	+	+	+	+	+	+	+
55° C., 10 minutes	+	+	+	+	−	+	−	−
55° C., 15 minutes	−	+	+	−	−	−	−	−
60° C., 5 minutes	−	+	+	−	−	−	−	−
60° C., 10 minutes	−	−	−	−	−	−	−	−
65° C., 5 minutes	−	−	−	−	−	−	−	−

The method used by Kitasato was first to transfer a platinum loop of the culture into a test tube containing gelatin which had previously been melted. This tube was then introduced into a water bath which had been brought up to the temperature required. After the time stated, the gelatin tubes were rolled and incubated at 20° to 22° C. Kitasato found no difference between old and young cultures of cholera so far as their resistance to heat was concerned, and further concluded that no material difference was evident so far as the resistance of cholera cultures are concerned against temperatures of 50° to 60°.

[a] Van Geuns: Über des Pasteurisiren von Bakterien. Ein Beiträg zur Biologie der Microorganismen. Arch. f. Hyg., vol. 9, 1889, p. 369.

[b] Sternberg: Manual of Bacteriology, 1892, p. 146, and Report of the Committee on Disinfectants of the American Public Health Association, pp. 136, 152.

[c] Kitasato, S.: Die Widerstandsfähigkeit der Cholerabacterien gegen das Eintrocknen und gegen Hitze. Zeit. f. Hyg., vol. 5, 1889, p. 135.

Friedel, Kutscher, and Meinicke,[a] 1904, found that the cholera vibrio was not killed when the temperature reached 58°, but was dead as soon as 60° was reached. It required seven to eight minutes for the milk to reach 60°.

These experiments with the cholera organism were conducted with and without the enrichment methods. The enrichment methods consist of first planting a milk culture in peptone water, incubating twenty-four hours, and then plating into litmus-lactose-agar. With the enrichment method it was found that cholera withstood sixty minutes at 50°, but only twenty-five minutes without the enrichment method. At 53° it withstood forty minutes with and fifteen minutes without the enrichment method.

ORIGINAL EXPERIMENTS.

In my work I used three different cultures with the following results:

EXPERIMENT No. 23.

B. choleræ.

Forty-eight hours' growth in sterilized milk. Milk at 28° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number of colonies per loop in agar.
"Manila;" reaction, 0.180 per cent acid:			
At start	28	Growth	450,000
1½ minutes after immersion	45	do	3,750
1¾ minutes after immersion	48	No growth	[b] 10
1¾ minutes after immersion	50	do	None.
2 minutes after immersion	51	do	None.
2½ minutes after immersion	52	do	None.
2¾ minutes after immersion	53	do	None.
3 minutes after immersion	54	do	None.
3¾ minutes after immersion	55	do	None.
"Hamburg;" reaction, 0.229 per cent acid:			
At start	28	Growth	87,500
1½ minutes after immersion	45	do	144
1¾ minutes after immersion	48	No growth	[b] 4
1¾ minutes after immersion	50	do	None.
2 minutes after immersion	51	do	None.
2½ minutes after immersion	52	do	None.
2¾ minutes after immersion	53	do	None.
3 minutes after immersion	54	do	None.
3¾ minutes after immersion	55	do	None.

[a] Friedel, Kutscher, and Meinicke: Die Widerstandsfähigkeit der Erreger der wichtigsten Darmkrankheiten gegen Erwärmen auf verschiedene Temperaturen in Milch. Klin. Jahrb., vol. 13, 1904-05, p. 324.

[b] Contaminated.

EXPERIMENT No. 24.

B. choleræ.

Three days' growth in sterilized milk. Milk at 28° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.	Number of colonies per loop in agar.
"Manila;" reaction, 0.219 per cent acid:			
At start	28	Growth	(a)
1½ minutes after immersion	50	(Lost)	
2 minutes after immersion	55	No growth	
3 minutes after immersion	58	do	None.
5½ minutes after immersion	60	do	None.
"Paris;" reaction, 0.189 per cent acid:			
At start	28	Growth	(a)
1½ minutes after immersion	50	No growth	
2 minutes after immersion	55	do	
3 minutes after immersion	58	do	None.
5½ minutes after immersion	60	do	None.

[a] Innumerable.

EXPERIMENT No. 25.

B. choleræ.

Culture, "Hamburg;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.216 per cent acid.

The milk at 31° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in agar.
At start	31	(a)
1½ minutes after immersion	45	41
1¾ minutes after immersion	48	None.
1¾ minutes after immersion	50	None.
2 minutes after immersion	51	None.
2¼ minutes after immersion	52	None.
2½ minutes after immersion	53	None.
3 minutes after immersion	54	None.
4 minutes after immersion	55	None.

[a] Innumerable.

EXPERIMENT No. 26.

B. choleræ.

Culture, "Manila;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.210 per cent acid.

The milk at 31° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in agar.
At start	31	(a)
1 minute after immersion	45	6,600
1½ minutes after immersion	48	628
1¾ minutes after immersion	50	546
2 minutes after immersion	51	0
2½ minutes after immersion	52	0
2¾ minutes after immersion	53	0
4 minutes after immersion	54	0
5 minutes after immersion	55	0

[a] Innumerable.

EXPERIMENT No. 27.

B. choleræ.

Culture, "Manila;" twenty-four hours' growth in sterilized milk. Reaction, 0.180 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Number colonies per loop in gelatin.
At start	24	(a)
1½ minutes after immersion	45	1,164
2 minutes after immersion	50	32
2½ minutes after immersion	52	0
2¾ minutes after immersion	53	0
3¾ minutes after immersion	54	0
5 minutes after immersion	55	0
6 minutes after immersion	1 minute at 55	0
7 minutes after immersion	2 minutes at 55	0
8 minutes after immersion	3 minutes at 55	0

[a] Innumerable.

EXPERIMENT No. 28.

B. choleræ.

Culture, "Manila;" twenty-four hours' growth in sterilized milk. Reaction, 0.198 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Number colonies per loop in gelatin.
At start	24	(a)
1½ minutes after immersion	45	(b)
2 minutes after immersion	50	245
2½ minutes after immersion	52	205
3 minutes after immersion	53	22
3½ minutes after immersion	54	0
4½ minutes after immersion	55	0
5½ minutes after immersion	1 minute at 55	0
6½ minutes after immersion	2 minutes at 55	0
7½ minutes after immersion	3 minutes at 55	0

a Innumerable. b Innumerable, but less.

EXPERIMENT No. 29.

B. choleræ.

Culture, "Manila;" twenty-four hours' growth in sterilized milk. Reaction, 0.180 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Number colonies per loop in gelatin.
At start	24	(a)
1½ minutes after immersion	45	1,680
2 minutes after immersion	50	244
2½ minutes after immersion	52	47
2½ minutes after immersion	53	0
3½ minutes after immersion	54	0
4½ minutes after immersion	55	0
5½ minutes after immersion	1 minute at 55	0
6½ minutes after immersion	2 minutes at 55	0
7½ minutes after immersion	3 minutes at 55	0

a Innumerable.

EXPERIMENT No. 30.

B. choleræ.

Culture, "Manila;" twenty-four hours' growth in sterilized milk. Reaction, 0.181 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Number colonies per loop in gelatin.
At start	24	(a)
1½ minutes after immersion	45	4,455
2 minutes after immersion	50	1,100
2½ minutes after immersion	52	90
3 minutes after immersion	53	7
3½ minutes after immersion	54	0
5½ minutes after immersion	55	0
6½ minutes after immersion	1 minute at 55	0
7½ minutes after immersion	2 minutes at 55	0
8½ minutes after immersion	3 minutes at 55	0

a Innumerable.

EXPERIMENT No. 31.

B. choleræ.

Culture, "Hamburg;" two days' growth in sterilized milk. Reaction, 0.189 per cent acid.

Milk immersed at 25.3° C. in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.
At start	25.3	Growth.
1½ minutes after immersion	45	Do.
2 minutes after immersion	50	No growth.
2½ minutes after immersion	51	Do.
2½ minutes after immersion	52	Do.
2½ minutes after immersion	53	Do.
3½ minutes after immersion	54	Do.
4½ minutes after immersion	55	Do.
5½ minutes after immersion	1 minute at 55	Do.
6½ minutes after immersion	2 minutes at 55	Do.
7½ minutes after immersion	3 minutes at 55	Do.

EXPERIMENT No. 32.

B. choleræ.

Culture, "Manila;" forty-eight hours' growth in sterilized milk. Reaction, 0.180 per cent acid.

Milk at 26.3° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bouillon.
At start	26.3	Growth.
1½ minutes after immersion	45	Do.
1¾ minutes after immersion	50	Do.
2¼ minutes after immersion	51	No growth.
2½ minutes after immersion	52	Do.
2¾ minutes after immersion	53	Do.
3¼ minutes after immersion	54	Do.
4¼ minutes after immersion	55	Do.
5¼ minutes after immersion	1 minute at 55	Do.
6¼ minutes after immersion	2 minutes at 55	Do.
7¼ minutes after immersion	3 minutes at 55	Do.

EXPERIMENT No. 33.

B. choleræ.

Culture, "Hamburg;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.216 per cent acid.

The milk at 31° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	About ½ c. c. of milk culture into bouillon.
At start	31	Growth.
1 minute after immersion	45	Do.
1½ minutes after immersion	48	No growth.
1¾ minutes after immersion	50	Growth.
1¾ minutes after immersion	51	No growth.
2 minutes after immersion	52	Growth.
2½ minutes after immersion	53	No growth.
3 minutes after immersion	54	Do.
4¾ minutes after immersion	55	Do.

EXPERIMENT No. 34.

B. choleræ.

Culture, "Manila;" seventy-two hours' growth in sterilized milk. Reaction of milk, 0.210 per cent acid.

The milk at 31° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	About ½ c. c. of milk culture into bouillon.
At start	31	Growth.
1 minute after immersion	45	Do.
1½ minutes after immersion	48	Do.
1¾ minutes after immersion	50	Do.
1¾ minutes after immersion	51	Do.
2 minutes after immersion	52	Do.
2½ minutes after immersion	53	Do.
3 minutes after immersion	54	(Lost.)
4¾ minutes after immersion	55	No growth.

EXPERIMENT No. 35.

B. choleræ.

Culture, "Hamburg;" forty-eight hours' growth in sterilized milk. Reaction, 0.140 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	45	Do.
1¾ minutes after immersion	50	Do.
2 minutes after immersion	53	Do.
2½ minutes after immersion	55	Do.
2¾ minutes after immersion	57	No growth.
3½ minutes after immersion	59	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	Do.
6½ minutes after immersion	2 minutes at 60	Do.

EXPERIMENT No. 36.

B. choleræ.

Culture, "Manila;" forty-eight hours' growth in sterilized milk. Reaction, 0.09 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	45	Do.
1¾ minutes after immersion	50	Do.
2 minutes after immersion	53	Do.
2½ minutes after immersion	55	No growth.
2¾ minutes after immersion	57	Do.
3½ minutes after immersion	59	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	Do.
6½ minutes after immersion	2 minutes at 60	Do.

EXPERIMENT No. 37.

B. choleræ.

Culture, "Hamburg;" forty-eight hours' growth in sterilized milk. Reaction, 0.189 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon
At start	26	Growth.
1½ minutes after immersion	52	Do.
2 minutes after immersion	55	Do.
5 minutes after immersion	60	No growth.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.

EXPERIMENT No. 38.

B. choleræ.

Culture, "Manila;" forty-eight hours' growth in sterilized milk. Reaction, 0.16 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	26	Growth.
1½ minutes after immersion	52	Do.
2 minutes after immersion	55	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	No growth.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.

EXPERIMENT No. 39.

B. choleræ.

Culture, "Hamburg;" forty-eight hours' growth in whole milk that had been sterilized by the fractional method three days. Reaction, 0.243 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C).	1 c. c. milk culture in bouillon.
At start	21	Growth.
1½ minutes after immersion	50	Do.
1½ minutes after immersion	53	Do.
1¾ minutes after immersion	55	Do.
2¼ minutes after immersion	57	No growth.
3 minutes after immersion	59	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	Do.
6½ minutes after immersion	2 minutes at 60	Do.
7½ minutes after immersion	3 minutes at 60	Do.

EXPERIMENT No. 40.

B. choleræ.

Culture, "Manila;" forty-eight hours' growth in whole milk that had been sterilized by the fractional method three days. Reaction, 0.234 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	1 c. c. milk culture in bouillon.
At start	21	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	53	Do.
2½ minutes after immersion	55	No growth.
2¾ minutes after immersion	57	Do.
3½ minutes after immersion	59	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.

Conclusion.—The cholera vibrio is similar to the diphtheria bacillus so far as its thermal death point is concerned. It is usually destroyed when the milk reaches 55° C.; only once did it survive to 60° C. under the conditions of the experiments.

BACILLUS DYSENTERIÆ.

The only reference to the thermal death point of the *B. dysenteriæ* I have been able to find is the work done under Kolle's direction by Friedel, Kutscher, and Meinicke,[a] who found that the dysentery bacillus withstands a temperature of 60° for eight minutes, but is killed at 65° for two minutes. In these experiments it required five minutes to heat the milk from 15° C. to the temperature noted.

I used eight different cultures of the dysentery bacillus, representing both the Shiga and the Flexner types. My results are given in the following tables:

EXPERIMENT No. 41.

B. Dysenteriæ.

Three days' growth in sterilized milk. Milk immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in bullion.	Number of colonies per loop in agar.
"Duval;" reaction, 0.126 per cent acid:			
At start	28	Growth	(b)
1½ minutes after immersion	55	do	1,800
2½ minutes after immersion	58	do	28
3½ minutes after immersion	60	No growth	0
4½ minutes after immersion	(c)	do	0
"Sils;" reaction, 0.162 per cent acid:			
At start	29	Growth	(b)
1½ minutes after immersion	55	do	1,110
2½ minutes after immersion	58	do.[d]	56
3 minutes after immersion	60	No growth	0
4 minutes after immersion	(c)	do	0
"Kruse;" reaction, 0.187 per cent acid:			
At start	28	Growth	(b)
1½ minutes after immersion	55	do	126
2½ minutes after immersion	58	do.[d]	0
3½ minutes after immersion	60	No growth	0
4½ minutes after immersion	(c)	do	0
"Mt. Desert;" reaction, 0.198 per cent acid:			
At start	28	Growth	(b)
1½ minutes after immersion	55	do	57
2½ minutes after immersion	58	No growth	14
4½ minutes after immersion	60	do	0
5½ minutes after immersion	(c)	do	0
"Salant;" reaction, 0.189 per cent acid:			
At start	29	Growth	(b)
1½ minutes after immersion	55	do	(b)
2½ minutes after immersion	58	do	154
3½ minutes after immersion	60	No growth	0
4½ minutes after immersion	(c)	do	0

[a] Friedel, Kutscher, and Meinicke: Die Widerstandsfähigkeit der Erreger der wichtigsten Darmkrankheiten gegen Erwärmen auf verschiedene Temperaturen in Milch. Klin. Jahrb., vol. 3, 1904-5, p. 34.
[b] Innumerable. [c] One minute at 60°. [d] Delayed.

EXPERIMENT No. 42.

B. dysenteriæ.

Culture, "Salent;" forty-eight hours' growth in sterilized milk. Reaction, 0.18 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	45	Do.
1¾ minutes after immersion	50	Do.
2½ minutes after immersion	55	Do.
3 minutes after immersion	57	Do.
3½ minutes after immersion	58	Do.
4½ minutes after immersion	59	Do.
5¾ minutes after immersion	59	Do.
6¾ minutes after immersion	60	Do.
7¾ minutes after immersion	1 minute at 60	Do.

EXPERIMENT No. 43.

B. dysenteriæ.

Culture, "Sils;" forty-eight hours' growth in sterilized milk. Reaction, 0.176 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	45	Do.
1¾ minutes after immersion	50	Do.
2½ minutes after immersion	55	Do.
2¾ minutes after immersion	57	Do.
3 minutes after immersion	58	Do.
3½ minutes after immersion	59	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.

EXPERIMENT No. 44.

B. dysenteriæ.

Culture, "Salant;" forty-eight hours' growth in sterilized milk. Reaction, 0.135 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
3½ minutes after immersion	60	Do.
4½ minutes after immersion	1 minute at 60	Do.
5½ minutes after immersion	2 minutes at 60	No growth.
6½ minutes after immersion	3 minutes at 60	Do.
7½ minutes after immersion	4 minutes at 60	Do.
8½ minutes after immersion	5 minutes at 60	Do.

EXPERIMENT No. 45.

B. dysenteriæ.

Culture, "Salant;" forty-eight hours' growth in sterilized milk. Reaction, 0.234 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
At start	26	Growth.
2 minutes after immersion	55	Do.
3 minutes after immersion	58	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
10 minutes after immersion	5 minutes at 60	No growth.
13 minutes after immersion	8 minutes at 60	Do.
15 minutes after immersion	10 minutes at 60	Do.
20 minutes after immersion	15 minutes at 60	Do.

EXPERIMENT No. 46.

B. dysenteriæ.

Culture "Duval;" forty-eight hours' growth in sterilized milk. Reaction, 0.108 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
At start	26	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	Do.
6½ minutes after immersion	2 minutes at 60	Do.
7½ minutes after immersion	3 minutes at 60	No growth.
9½ minutes after immersion	5 minutes at 60	Do.
14½ minutes after immersion	10 minutes at 60	Do.

EXPERIMENT No. 47.

B. dysenteriæ.

Culture, "Sils;" forty-eight hours' growth in sterilized milk. Reaction, 0.165 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (°C.).	½ c. c. milk culture in bouillon.
At start	26	Growth.
2 minutes after immersion	55	Do.
3 minutes after immersion	58	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	No growth.
7 minutes after immersion	2 minutes at 60	Do.
10 minutes after immersion	5 minutes at 60	Do.
13 minutes after immersion	8 minutes at 60	Do.
15 minutes after immersion	10 minutes at 60	Do.
20 minutes after immersion	15 minutes at 60	Do.

EXPERIMENT No. 48.

B. dysenteriæ.

Culture, "Kruse;" forty-eight hours' growth in sterilized milk. Reaction, 0.144 per cent acid.

The milk at 24° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature. (° C.).	½ c. c. milk culture in bouillon.
At start	24	Growth.
1½ minutes after immersion	50	Do.
2½ minutes after immersion	55	Do.
3 minutes after immersion	58	Do.
3½ minutes after immersion	60	Do.
4½ minutes after immersion	60.5	No growth.
5½ minutes after immersion	61	Do.
6½ minutes after immersion	61.5	Do.
7½ minutes after immersion	61.5	Do.
8½ minutes after immersion	61	Do.

EXPERIMENT No. 49.

B. dysenteriæ.

Culture, "Witaus;" forty-eight hours' growth in sterilized milk. Reaction, 0.234 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	25	Growth.
1½ minutes after immersion	50	Do.
2 minutes aftes immersion	55	Do.
3 minutes after immersion	58	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.
10 minutes after immersion	5 minutes at 60	Do.
15 minutes after immersion	10 minutes at 60	No growth.

EXPERIMENT No. 50.

B. dysenteriæ.

Culture, "Wilson;" forty-eight hours' growth in sterilized milk. Reaction, 0.144 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	25	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.
10 minutes after immersion	5 minutes at 60	Do.
15 minutes after immersion	10 minutes at 60	No growth.

EXPERIMENT No. 51.

B. dysenteriæ.

Culture, "Mt. Desert;" forty-eight hours' growth in sterilized milk. Reaction, 0.252 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	26	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.
10 minutes after immersion	5 minutes at 60	No growth.
15 minutes after immersion	10 minutes at 60	Do.

EXPERIMENT No. 52.

B. dysenteriæ.

Culture, "Harris;" forty-eight hours' growth in sterilized milk. Reaction, 0.234 per cent acid.

The milk at 26° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	½ c. c. milk culture in bouillon.
At start	26	Growth.
1½ minutes after immersion	50	Do.
2 minutes after immersion	55	Do.
2½ minutes after immersion	58	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	Do.
6½ minutes after immersion	2 minutes at 60	Do.
7½ minutes after immersion	3 minutes at 60	Do.
9½ minutes after immersion	5 minutes at 60	No growth.
14½ minutes after immersion	10 minutes at 60	Do.

EXPERIMENT No. 53.

B. dysenteriæ.

Culture, "Sils;" forty-eight hours' growth in whole milk that had been sterilized by the fractional method three days. Reaction, 0.288 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	1 c. c. milk culture in bouillon.
At start	21	Growth.
2 minutes after immersion	55	Do.
2½ minutes after immersion	57	Do.
3½ minutes after immersion	59	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	Do.
10 minutes after immersion	5 minutes at 60	No growth.
15 minutes after immersion	10 minutes at 60	Do.

EXPERIMENT No. 54.

B. dysenteriæ.

Culture, "Shiga;" forty-eight hours' growth in whole milk that had been sterilized by the fractional method three days. Reaction, 0.27 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature. (° C.).	1 c. c. milk culture in bouillon.
At start	21	Growth.
2 minutes after immersion	55	Do.
2½ minutes after immersion	57	Do.
3½ minutes after immersion	59	Do.
4½ minutes after immersion	60	Do.
5½ minutes after immersion	1 minute at 60	Do.
6½ minutes after immersion	2 minutes at 60	Do.
7½ minutes after immersion	3 minutes at 60	Do.
9½ minutes after immersion	5 minutes at 60	Do.
14½ minutes after immersion	10 minutes at 60	No growth.

EXPERIMENT No. 55.

B. dysenteriæ.

Culture, "Duval;" forty-eight hours' growth in whole milk that had been sterilized by the fractional method three days. Reaction, 0.306 per cent acid.

The milk at 21° C. immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature. (° C.).	1 c. c. milk culture in bouillon.
At start	21	Growth.
2 minutes after immersion	55	Do.
2½ minutes after immersion	57	Do.
3½ minutes after immersion	59	Do.
5 minutes after immersion	60	Do.
6 minutes after immersion	1 minute at 60	Do.
7 minutes after immersion	2 minutes at 60	Do.
8 minutes after immersion	3 minutes at 60	No growth.
10 minutes after immersion	5 minutes at 60	Do.
15 minutes after immersion	10 minutes at 60	Do.

Conclusion—The dysentery bacillus is somewhat more resistant to heat than the typhoid bacillus. It sometimes withstands heating at 60° for five minutes. All are killed at 60° C. for ten minutes. However, the great majority of these micro-organisms are killed by the time the milk reaches 60° C.

MICROCOCCUS MELITENSIS.

Maj. W. H. Horrocks and Capt. J. C. Kennedy, of the British Army Medical Corps, in their article upon goats as a means of propagating Mediterranean fever,[a] made several experiments to determine whether it is possible to destroy the *M. melitensis* by pasteurization of the infected milk, and concluded that heating the milk to 68° C. for ten minutes destroyed the *M. melitensis* present in infected goats' milk. No record, however, is made of experiments with lower temperatures.

Experiment 1.—Milk was drawn from goats 1, 2, 3, 5, and 6 and thoroughly mixed. This mixed milk was selected for experiment as it contained thick, ropy masses, and it was thought that these might act as protecting envelopes to the specific micrococci, so that if such a milk were sterilized by pasteurization it might safely be concluded that any ordinary normal-looking milk would be equally sterilized by the same operation.

One loopful of the mixed milk was stroked on a series of surface plates to act as a control. The mixed milk was then heated on a water bath to 68° C., and this temperature was maintained for ten minutes. The milk was then rapidly cooled and 10 c. c. of the sterilized milk were spread over 20 litmus-nutrose-agar plates.

Results: After four days incubation at 37° C. the control plates were found densely crowded with colonies of the *M. melitensis;* the plates made from the pasteurized milk remained free from any signs of the specific *Micrococcus melitensis*, even though the incubation was continued for fourteen days.

Experiment 2.—This served as a control of experiment 1, the same procedure being followed. The *Micrococcus melitensis* appeared in the control plates, but the plates made with the pasteurized milk again remained perfectly sterile.

In my experiments I used two strains of the *M. melitensis*. The results follow:

EXPERIMENT NO. 56.

M. melitensis.

Culture, seven days' growth in bouillon, mixed with milk that had been inoculated the previous day with same culture. Reaction of milk, 0.081 per cent acid.

The milk at 31° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (° C.).	Loop of milk culture in agar.
At start	31	Innumerable.
1½ minutes after immersion	45	Do.
1½ minutes after immersion	48	Do.
1¾ minutes after immersion	50	Do.
2 minutes after immersion	51	Do.
2½ minutes after immersion	52	Do.
2½ minutes after immersion	53	Do.
3 minutes after immersion	54	Do.
4 minutes after immersion	55	Do.

[a] Horrocks, W. H., and Kennedy, J. C.: VI. Goats as a means of propagation of Mediterranean fever. Reports of the commission * * * for the investigation of Mediterranean fever * * * Part 4. London, Harrison & Sons, Feb., 1906. 8° Paper. 187 p.

EXPERIMENT No. 57.

M. melitensis.

Culture, seven days' growth in bouillon, mixed with milk that had been inoculated the previous day with same culture. Reaction of milk, 0.081 per cent acid.

The milk at 31° C. immersed in constant-temperature water bath at 55° C.

Milk culture.	Temperature (°C.).	About ½ c.c. of milk culture into bouillon.	Loop of milk culture in bouillon.
At start	31	Growth.	Growth.
1 minute after immersion	45	.....do....	Do.
1½ minutes after immersion	48	.....do....	Do.
1¾ minutes after immersion	50	.....do....	Do.
2 minutes after immersion	51	.....do....	Do.
2¼ minutes after immersion	52	.....do....	Do.
2½ minutes after immersion	53	.....do....	Do.
3 minutes after immersion	54	.....do....	Do.
4½ minutes after immersion	55	.....do....	Do.

EXPERIMENT No. 58.

M. melitensis.

Five days' growth in sterilized milk. Milk immersed in constant-temperature water bath at 60° C.

Milk culture.	Temperature (° C.).	Number of colonies per loop in agar.
"Stock" culture; reaction, 0.108 per cent acid:		
At start	30	Innumerable.
½ minute after immersion	45	Do.
1 minute after immersion	50	Do.
1½ minutes after immersion	55	Do.
1¾ minutes after immersion	58	53.
2 minutes after immersion	60	0
3 minutes after immersion	1 minute at 60	0
"U. S. N." culture; reaction, 0.072 per cent acid:		
At start	33	Innumerable.
½ minute after immersion	45	Do.
1 minute after immersion	50	Do.
1½ minutes after immersion	55	Do.
2 minutes after immersion	58	Do.
2¾ minutes after immersion	60	0
3¾ minutes after immersion	1 minute at 60	0

NOTE. Agar plates incubated five days at 37°C.

Conclusion.—So far as can be judged from the meager evidence at hand, 60° C. for twenty minutes is more than sufficient to destroy the infective principle of Malta fever in milk. The *M. melitensis* is not destroyed at 55° for a short time; the great majority die at 58°; at 60° all are killed.

GENERAL SUMMARY AND CONCLUSIONS.

It is difficult to determine precisely at what moment or at what temperature a micro-organism dies. The fact that a micro-organism will not grow upon artificial media is not always a sure sign that it is dead; but with the exception of the tubercle bacillus it is safe to assume that ordinarily bacteria that fail to vegetate upon suitable media under favorable conditions have at least lost their virulence and power to infect, especially when ingested by the mouth.

We know, however, that the vegetability of micro-organisms *in vitro* does not always correspond to their ability to grow in the animal host. This is especially true of the tubercle bacillus. On account of the reluctance with which this bacillus grows upon culture media, it is necessary to resort to animal inoculations in order to determine its thermal death point. It is proper to assume that the tubercle bacilli in milk which are so attenuated as to be unable to cause tuberculosis when injected into the peritoneal cavity of a young guinea pig would be harmless when ingested by man.

In these experiments upon the guinea pig it is important to differentiate the lesions produced by dead tubercle bacilli, which closely simulate those caused by the live tubercle bacilli. In doubtful cases it is necessary to inoculate the products of the lesions into another animal to determine the presence or absence of living micro-organisms.

The cultural experiments upon thermal death points are surrounded by many sources of error and numerous pitfalls, all of which must be avoided.

My experiments were designed to imitate the conditions of practical pasteurization. The micro-organisms were heated in open test tubes and the temperature and other factors accurately controlled. Scum formation was disregarded, as it was my intention to reach results that might be applied with confidence in practical pasteurization on a large scale against natural difficulties.

My results of nine series of tests upon guinea pigs with five cultures plainly show that in milk the tubercle bacillus loses its virulence and infective power when heated at 60° for twenty minutes; in other words, it may be considered dead. When heated to 65° C. a much shorter time is necessary. These results correspond in the main with those previously recorded by Yersin, Bonhoff, Schroeder, Th. Smith, Russell and Hastings, and Hesse.

It should be remembered that the milk in these tests was very heavily infected with virulent cultures, indicated by the prompt death of the control animals. Milk practically never contains such an enormous amount of infection under natural conditions. It is

justifiable, therefore, to assume that if 60° C. for twenty minutes is sufficient to destroy the infectiousness of such milk when injected into the peritoneal cavity of a guinea pig, any ordinary market milk after such treatment would be safe for human use by the mouth so far as tubercle bacilli are concerned.

The lesions produced by a large mass of dead tubercle bacilli may be distinguished by their extent rather than by their character. In doubtful cases secondary inoculation is the only trustworthy method of determining whether the bacilli are alive or dead. The tuberculin test does not differentiate between the live and dead tubercles. Three guinea pigs out of eight having lesions produced by dead tubercle bacilli (killed at 100° C.) died as the result of the subcutaneous inoculation of 2 c. c. tuberculin (O. T.).

The evidence is plain that milk heated to 60° C. and maintained at that temperature for two minutes will kill the typhoid bacillus. The great majority of these organisms are killed by the time the temperature reaches 59° C., and few survive to 60° C.

The diphtheria bacillus succumbs at comparatively low temperatures. Oftentimes it fails to grow after heating to 55° C. Some occasionally survive until the milk reaches 60° C.

The cholera vibrio is similar to the diphtheria bacillus so far as its thermal death point is concerned. It is usually destroyed when the milk reaches 55° C.; only once did it survive to 60° C. under the conditions of the experiments.

The dysentery bacillus is somewhat more resistant to heat than the typhoid bacillus. It sometimes withstands heating at 60° C. for five minutes. All are killed at 60° C. for ten minutes. However, the great majority of these micro-organisms are killed by the time the milk reaches 60° C.

So far as can be judged from the meager evidence at hand, 60° C. for twenty minutes is more than sufficient to destroy the infective principle of Malta fever in milk. The *M. melitensis* is not destroyed at 55° C. for a short time; the great majority of these organisms die at 58°, and at 60° all are killed.

Milk heated to 60° C. and maintained at that temperature for twenty minutes may, therefore, be considered safe so far as conveying infection with the micro-organisms tested is concerned.

NOTICE TO LIBRARIANS AND BIBLIOGRAPHERS CONCERNING THE SERIAL PUBLICATIONS OF THIS LABORATORY.

The Hygienic Laboratory was established in New York, at the Marine Hospital on Staten Island, August, 1887. It was transferred to Washington, with quarters in the Butler Building, June 11, 1891, and a new laboratory building, located in Washington, was authorized by act of Congress, March 3, 1901.

The following *bulletins* [Bulls. Nos. 1–7, 1900 to 1902, Hyg. Lab., U. S. Mar.-Hosp. Serv., Wash.] have been issued.

No. 1.- Preliminary note on the viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 2.- Formalin disinfection of baggage without apparatus. By M. J. Rosenau.

No. 3.- Sulphur dioxid as a germicidal agent. By H. D. Geddings.

No. 4. Viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 5.- An investigation of a pathogienic microbe (*B. typhi murium* Danyz) applied to the destruction of rats. By M. J. Rosenau.

No. 6. Disinfection against mosquitoes with formaldehyd and sulphur dioxid. By M. J. Rosenau.

No. 7. Laboratory technique: Ring test for indol, by S. B. Grubbs and Edward Francis; Collodium sacs, by S. B. Grubbs and Edward Francis; Microphotography with simple apparatus, by H. B. Parker.

By act of Congress approved July 1, 1902, the name of the "United States Marine Hospital Service" was changed to the "Public Health and Marine-Hospital Service of the United States," and three new divisions were added to the Hygienic Laboratory.

Since the change of name of the Service the bulletins of the Hygienic Laboratory have been continued in the same numerical order, as follows:

No. 8.—Laboratory course in pathology and bacteriology. By M. J. Rosenau. (Revised edition March, 1904.)

No. 9.— Presence of tetanus in commercial gelatin. By John F. Anderson.

No. 10.- Report upon the prevalence and geographic distribution of hookworm disease (uncinariasis or anchylostomiasis) in the United States. By Ch. Wardell Stiles.

No. 11. An experimental investigation of *Trypanosoma lewisi*. By Edward Francis.

No. 12.- The bacteriological impurities of vaccine virus: an experimental study. By M. J. Rosenau.

No. 13.—A statistical study of the intestinal parasites of 500 white male patients at the United States Government Hospital for the Insane: by Philip E. Garrison, Brayton H. Ransom, and Earle C. Stevenson. A parasitic roundworm (*Agamomermis culicis* n. g., n. sp.) in American mosquitoes (*Culex sollicitans*): by Ch. Wardell Stiles. The type species of the cestode genus *Hymenolepis;* by Ch. Wardell Stiles.

No. 14. Spotted fever (tick fever) of the Rocky Mountains: a new disease. By John F. Anderson.

No. 15. Inefficiency of ferrous sulphate as an antiseptic and germicide. By Allan J. McLaughlin.

No. 16. The antiseptic and germicidal properties of glycerin. By M. J. Rosenau.

No. 17. Illustrated key to the trematode parasites of man. By Ch. Wardell Stiles.

No. 18. An account of the tapeworms of the genus *Hymenolepis* parasitic in man, including reports of several new cases of the dwarf tapeworm (*H. nana*) in the United States. By Brayton H. Ransom.

No. 19.—A method for inoculating animals with precise amounts. By M. J. Rosenau.

No. 20.—A zoological investigation into the cause, transmission, and source of Rocky Mountain "spotted fever." By Ch. Wardell Stiles.

No. 21.—The immunity unit for standardizing diphtheria antitoxin (based on Ehrlich's normal serum). Official standard prepared under the act approved July 1, 1902. By M. J. Rosenau.

No. 22.—Chloride of zinc as a deodorant, antiseptic, and germicide. By T. B. McClintic.

No. 23.—Changes in the Pharmacopœia of the United States of America. Eighth Decennial Revision. By Reid Hunt and Murray Galt Motter.

No. 24.—The International Code of Zoological Nomenclature as applied to medicine. By Ch. Wardell Stiles.

No. 25.—Illustrated key to the cestode parasites of man. By Ch. Wardell Stiles.

No. 26.—On the stability of the oxidases and their conduct toward various reagents. The conduct of phenolphthalein in the animal organism. A test for saccharin, and a simple method of distinguishing between cumarin and vanillin. The toxicity of ozone and other oxidizing agents to lipase. The influence of chemical constitution on the lipolytic hydrolysis of etheral salts. By J. H. Kastle.

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No. 30.—I. Maternal transmission of immunity to diphtheria toxin. II. Maternal transmission of immunity to diphtheria toxin and hypersusceptibility to horse serum in the same animal. By John F. Anderson.

No. 31.—Variations in the peroxidase activity of the blood in health and disease. By Joseph H. Kastle and Harold L. Amoss.

No. 32.—A stomach lesion in guinea pigs caused by diphtheria toxine and its bearing upon experimental gastric ulcer. By M. J. Rosenau and John F. Anderson.

No. 33.—Studies in experimental alcoholism. By Reid Hunt.

No. 34.—I. *Agamofilaria georgiana* n. sp., an apparently new roundworm parasite from the ankle of a negress. II. The zoological characters of the roundworm genus *Filaria* Mueller, 1787. III. Three new American cases of infection of man with horsehair worms (species Paragordius varius), with summary of all cases reported to date. By Ch. Wardell Stiles.

No. 35.—Report on the origin and prevalence of typhoid fever in the District of Columbia. By M. J. Rosenau, L. L. Lumsden, and Joseph H. Kastle. (Including articles contributed by Ch. Wardell Stiles, Joseph Goldberger, and A. M. Stimson.

No. 36.—Further studies upon hypersusceptibility and immunity. By M. J. Rosenau and John F. Anderson.

No. 37.—Index-catalogue of medical and veterinary zoology. Subjects: Trematoda and trematode diseases. By Ch. Wardell Stiles and Albert Hassall.

No. 38.—The influence of antitoxin upon post-diphtheritic paralysis. By M. J. Rosenau and John F. Anderson.

No. 39.—The antiseptic and germicidal properties of solutions of formaldeyhde and their action upon toxines. By John F. Anderson.

No. 40.—Miscellaneous Zoological Papers. By Ch. Wardell Stiles and Joseph Goldberger

No. 41.—Milk and its relation to the public health. By various authors.

No. 42.—The thermal death points of pathogenic micro-organisms in milk. By M. J. Rosenau.

TREASURY DEPARTMENT.
Public Health and Marine-Hospital Service of the United States.

HYGIENIC LABORATORY.—BULLETIN No. 43.
MARCH, 1908.

THE STANDARDIZATION OF TETANUS ANTITOXIN

(AN AMERICAN UNIT ESTABLISHED UNDER AUTHORITY OF THE ACT OF JULY 1, 1902)

BY

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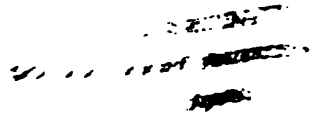

TREASURY DEPARTMENT.
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BY

M. J. ROSENAU
and
JOHN F. ANDERSON.

WASHINGTON:
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1908.

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THE STANDARDIZATION OF TETANUS ANTITOXIN[a]

[An American unit established under authority of the act of July 1, 1902.]

By MILTON J. ROSENAU,
Surgeon, Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service,
and
JOHN F. ANDERSON,
Passed Assistant Surgeon, Assistant Director Hygienic Laboratory, U. S. Public Health and Marine-Hospital Service.

INTRODUCTION.

There are now four methods of measuring the strength of tetanus antitoxin: (1) The German method described by Behring, (2) the French method of Roux, (3) the Italian method after Tizzoni, and (4) the American method described in this bulletin.

The European standards are admitted to be unsatisfactory and, for the most part, not accurate; further, they are complicated and difficult to carry out. The American method adopted officially under the law of July 1, 1902, for this country is the result of several years, work upon this subject in the Hygienic Laboratory and it is believed will commend itself for its simplicity, directness, and accuracy.

The standard toxines and antitoxins are preserved under special precautions to prevent deterioration and are tested against each other reciprocally, so that the least alteration in either may be detected.

While the unit is based upon the neutralizing value of an arbitrary quantity of antitoxic serum, the *antitoxin* is not issued to other laboratories for the purposes of test, as is the case with diphtheria. A stable precipitated tetanus *toxine*, the test dose of which has been carefully determined, is given out. All the tetanus antitoxic serums for use in man upon the American market are now measured against this same standard toxine and have therefore precisely comparable strengths.

The need of uniformity in standardizing this valuable prophylactic serum is evident from the table on page 11, from which it will be seen

[a] Manuscript submitted for publication March 4, 1908.

that before the establishment of an American standard the tetanus serums upon the market varied extravagantly in the unit strength claimed, and were, for the most part, comparatively weak in true antitoxic potency. Since the promulgation of this standard unit the serums on the market have decidedly greater antitoxic value. The feebleness of the foreign serums compared with those of American manufacture is also evident from the table.

The object of this bulletin is to describe in detail the methods used in preparing and using this standard. A discussion of the theoretical considerations is introduced for a better understanding of the principles involved.

AMERICAN UNIT, AND METHODS OF STANDARDIZATION.

DEFINITIONS.—"The immunity unit for measuring the strength of tetanus antitoxin shall be ten times the least quantity of antitetanic serum necessary to save the life of a 350-gram guinea pig for ninety-six hours against the official test dose of a standard toxin furnished by the Hygienic Laboratory of the Public Health and Marine-Hospital Service."

The unit was thus officially defined October 25, 1907, in Treasury Department Circular No. 61. This circular amended the regulations promulgated in accordance with the act approved July 1, 1902, entitled "An act to regulate the sale of viruses, serums, toxins, and analogous products in the District of Columbia, to regulate interstate traffic in said articles, and for other purposes."

Based largely upon the work on the standardization of tetanus antitoxin done in the Hygienic Laboratory, a special committee of the Society of American Bacteriologists, which met in New York December 27 and 28, 1906, made the following report, which was unanimously adopted:

That tetanus antitoxin be standardized by the tetanus toxin furnished by the Public Health and Marine-Hospital Service. The unit is ten times the least amount of serum necessary to save the life of a 350-gram guinea pig for ninety-six hours against the official test dose of the standard toxin. The test dose is 100 minimal lethal doses of a precipitated toxin preserved under special conditions at the Hygienic Laboratory of the Public Health and Marine-Hospital Service. It was decided that the minimal immunizing dose for a case of possible infection through a wound should be 1,500 of such units. It was decided that after April 1 the new unit should be adopted by all producers of tetanus antitoxin.

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The American unit for measuring the strength of tetanus antitoxin may be defined as the neutralizing power possessed by an arbitrary quantity of antitetanic serum preserved under special conditions to prevent deterioration in the Hygienic Laboratory of the Public Health and Marine-Hospital Service. This arbitrary quantity now contains ten times the amount of tetanus antitoxin necessary to neutralize somewhat less than 100 minimal lethal doses of a standard toxine for a 350-gram guinea pig—that is, one-tenth of a unit mixed with 100 minimal lethal doses of the standard toxine contains just enough free poison in the mixture to kill the guinea pig in four days after subcutaneous injection.

The standardization of tetanus antitoxin does not differ radically from the standardization of diphtheria antitoxin. The toxines and antitoxins are measured against each other reciprocally, so that change or deterioration of either the standard toxine or the standard antitoxin may readily be determined. Duplicate toxines and antitoxins made from time to time will act as checks against deterioration of either the standard toxines or antitoxins.

The value of an unknown serum is measured indirectly through the toxine, using the L+ dose as the test dose. The L+ dose is the smallest quantity of tetanus toxine that will neutralize one-tenth of an immunity unit, plus a quantity of toxine sufficient to kill the animal in just four days.

The *toxine* and not the *antitoxin* is given out to licensed manufacturers and others interested for the purposes of standardizing their serums. The L+ or test dose of the particular toxine (A) now dispensed contains just 100 minimal lethal doses for a 350-gram guinea pig. This particular toxine is very stable and has not changed appreciably in two years. As soon as it alters or is exhausted the next toxine that will be issued may contain considerably more or less than 100 minimal lethal doses, but the test dose will contain precisely the same neutralizing power.

The antitoxic serum, for the purposes of this standard, was obtained from a single horse. The serum was reduced to dryness and ground to an impalpable powder. The powder so obtained is preserved in many vacuum tubes under the influence of pentaphosphoric acid. These tubes are kept in absolute darkness at a constant temperature of 5° C. Every two months, or oftener, one of these tubes is opened, dissolved in a solution of glycerin 66 parts and isotonic salt solution 34 parts, and tested.

While the tetanus antitoxin preserved in dry powdered form under the conditions above named is stable, duplicates of the antitoxins made from time to time so as to guard against loss or change will insure the permanence of the standard which has now been established.

METHODS.

In order to obtain reliable and comparable results, it is necessary to take into account all the factors concerned—the composition of the poisons, their concentration, the diluting fluid, length of time the mixtures are allowed to stand, the site of inoculation, etc. All the known factors have been considered in our method of standardizing tetanus antitoxin, so that it is our belief that we now have as accurate and satisfactory a standard for this antitoxin as is the case with diphtheria.

Careful regard must be had for the following points in order to obtain uniform results:

The diluting fluid.—Salt solution containing 0.85 per cent chemically pure sodium chlorid ste[illegible] boiling is used for diluting both the toxine and the antito[illegible]

Time and temperature.—The [illegible] of toxine and antitoxin are kept one hour at room temperatur[illegible] iffused light before injection into the guinea pig.

Amount.—A total of 4 c. c. [illegible] toxine-antitoxin mixture is injected into the guinea pig. If [illegible] xine-antitoxin mixture does not equal 4 c. c., salt solution equal [illegible] amount to the difference is used to wash out the syringe, so [illegible]t the total amount injected and the pressure effects are always [illegible]qual.

Concentration of the toxine.—One-tenth of a gram of the dried tetanus toxine (A) is dissolved in 166.66 c. c. salt solution. One c. c. of this dilution equals the test dose (L + dose).

Concentration of the antitoxin.—The dilution of the antitoxic serum should follow the tables on page 50.

Guinea pigs.—The guinea pigs should weigh 350 grams. Animals weighing from 300 to 400 grams are allowable in preliminary rough testing.

Site of injection.—The injection is always given subcutaneously into the tissues of the abdomen about the level of the umbilicus.[a]

Time of death.—The number of immunity units contained in the serum is determined from the amount given the animals that are living ninety-six hours after the inoculation of the mixtures.

An example of a test.—Carefully tare a weighing bottle, then add approximately 20 to 50 mg. of the dried poison. Again carefully weigh. Dissolve the toxine in the weighing bottle with salt solution (0.85) in the proportion of 0.1 gram of the dried poison to 166.66 c. c. of the salt solution. This proportion is used for the reason that each cubic centimeter of this solution will represent 0.000,6 gm. of the original dried poison (=100 MLD's). This proportion

[a] It is very important to inject the animals in the same place on account of the relation to the motor nerve endings and the distance to travel to the central nervous system.

is taken because it is very convenient in measuring out the test dose, which represents 1 c. c. of the solution. Thus:

44.5692 gm., bottle + toxine.
44.5300 gm., bottle.

.0392 gm., toxine.

0.1 gm. : 166.66 c. c. :: 0.0392 : x.

x = 65.33 c. c.

In other words, if the quantity of toxine placed in the weighing bottle should weigh, as in this instance, just 0.0392 gm., carefully deliver from an accurately graduated burette just 65.33 c. c. salt solution into the weighing bottle; and, as before stated, each cubic centimeter of this solution will be the L+ or test dose.

Now dissolve the serum of unknown value in accordance with the table of dilutions (page 50) and mix aliquot parts of the serum with the test dose of toxine, as follows:

TABLE No. 1.

No. of guinea pig.	Weight of guinea pig (grams).	Subcutaneous injection of a mixture of—		Time of death.
		Toxine (test dose).	Antitoxin.	
		Gram.	*c. c.*	
1	360	0.0006	0.001	2 days, 4 hours.
2	350	.0006	.0015	4 days, 1 hour.
3	350	.0006	.002	Symptoms.
4	360	.0006	.0025	Slight symptoms.
5	350	.0006	.003	No symptoms.

According to this series the guinea pig which received 0.0015 c. c. of the serum died in four days and one hour. Therefore 0.0015 c. c. of the serum contains one-tenth of an immunity unit, as the unit has been defined as ten times the least amount of antitetanic serum necessary to save the life of a 350-gram guinea pig 96 hours against the official test dose. This serum would, therefore, contain just 66 units per cubic centimeter.

On account of the importance of the L+ or test dose the following table is given showing the results of these tests with Toxine A.

TABLE No. 2. *Showing the results of the test (L+) dose of tetanus toxine A from January 17, 1907, to April 7, 1908.*

Guinea pig No.	Weight in grams.	Date.	Amount of toxine A.	Amount of antitoxin.	Time of death.	
			Gram.		*Days.*	*Hours.*
306	290	Jan. 17, 1907	0.0006	1 unit	4	0
326	300	Jan. 24, 1907	.0006	1 unit	3	3
334	315	do	.0006	1 unit	3	7
387	350	Feb. 20, 1907	.0006	1 unit	4	19
388	350	do	.0006	1 unit	4	8
389	350	do	.0006	1 unit	4	16

TABLE No. 2.—*Showing the results of the test (L+) dose of tetanus toxine A from January 17, 1907, to April 7, 1908*—Continued.

Guinea pig No.	Weight in grams.	Date.	Amount of toxine A.	Amount of antitoxin.	Time of death.	
			Gram.		*Days.*	*Hours.*
400	330	Feb. 25, 1907	0.0006	1 unit	4	21
401	315	do	.0006	1 unit	5	7
407	335	do	.0006	1 unit	4	16
408	315	do	.0006	1 unit	4	9
415	300	Mar. 5, 1907	.0006	1 unit	3	0
416	325	do	.0006	1 unit	3	10
422	300	do	.0006	1 unit	3	9
423	325	do	.0006	1 unit	3	10
430	290	Mar. 22, 1907	.0006	1 unit	4	11
431	290	do	.0006	1 unit	4	14
454	300	Mar. 28, 1907	.0006	1 unit	4	1
455	300	do	.0006	1 unit	3	18
509	300	Apr. 13, 1907	.0006	1 unit	3	17
510	295	do	.0006	1 unit	3	17
524	280	May 3, 1907	.0006	1 unit	3	18
525	290	do	.0006	1 unit	3	11
538	300	May 17, 1907	.0006	1 unit	3	20
539	320	do	.0006	1 unit	3	7
556	330	May 24, 1907	.0006	1 unit	2	20
557	350	do	.0006	1 unit	3	10
615	375	July 28, 1907	.0006	1 unit	2	22
616	380	do	.0006	1 unit	3	10
625	350	July 31, 1907	.0006	1 unit	3	13
626	350	do	.0006	1 unit	4	12
639	350	Sept. 6, 1907	.0006	1 unit	3	4
640	350	do	.0006	1 unit	3	2
654	325	Sept. 24, 1907	.0006	1 unit	3	17
655	370	do	.0006	1 unit	6	19
679	325	Nov. 11, 1907	.0006	1 unit	3	19
680	350	do	.0006	1 unit	4	0
683	350	Dec. 7, 1907	.0006	1 unit	3	15
684	360	do	.0006	1 unit	3	13
702	370	Dec. 19, 1907	.0006	1 unit	3	23
757	350	Apr. 7, 1908	.0006	1 unit	4	1
758	350	do	.0006	1 unit	3	18
759	350	do	.0006	1 unit	4	0

NECESSITY FOR THIS STANDARD.

We now know that when the symptoms of tetanus have developed the toxine has combined with the motor nerve cells and that the union between the cell and the poison is too strong for the antitoxin to break up. However, if the antitoxin is given in time the toxine is neutralized and rendered harmless. Tetanus antitoxin is therefore an exceedingly valuable prophylactic and for this purpose is coming into more general use both in human and veterinary practice.

Whether used as a prophylactic or curative agent it is important to use a potent serum. The law of July 1, 1902,[a] not only insures

serums of useful potency, but also establishes uniformity among the producers of tetanus antitoxin in America. The necessity of establishing uniformity for this product in American markets is evident from the following table:

TABLE No. 3.—*Showing the differences in the methods of testing tetanus antitoxin before the adoption of the American unit.*

Name.	Labeled.	Contents (cubic centimeters).	Units claimed according to special methods of standardization, per cubic centimeter.	Units according to the American standard, per cubic centimeter.
New York department of health, Albany (submitted by Dr. H. D. Pease for comparison).	One immunizing dose (No. 2929F).	.....	0.5	434
New York City department of health (submitted by Dr. W. H. Park for comparison).	.....	.....	700	166
H. K. Mulford Co. (bought on open market).	1,000,000 immunizing units (No. 2121).	10	100,000	77
Farbenfabrik vorm. Meister Lucius & Bruning, Hoechst, a/M (submitted for comparative tests).	Tetanus Antitoxin, 5 fach. Normal, Prüfungs dose = 1/500.	.....	.....	333
H. K. Mulford Co., No. 9971 (submitted for tests).	60,000,000 units.....	10	6,000,000	90
Parke, Davis & Co.....	.....	.....	60,000	700
New York department of health, Albany (submitted by Dr. H. D. Pease for comparison).	.....	.....	.75	769
Serum Antitetanique, Pasteur Institute, 10 c. c. fluid.	Unit value not stated.	10	Not stated.	40
Serum Antitetanique, Pasteur Institute..	Unit value not stated.	10	Not stated.	40
Tizzoni, Antitossina del Tetano, No. 2912, Dry.	Unit value not stated.	.....	Not stated.	[b] 83.3
Pasteur Institute, Serum antitetanique, II-7.	Unit value not stated.	10	Not stated.	66
Institute Bacteriologique de Lyon et du Sud-Est.	Unit value not stated.	10	Not stated.	(c)

[a] Dissolved in 26. c. c.
[b] This equals 833 units per gram of the dry serum.
[c] Less than 50.

Tetanus antitoxin is made by the following laboratories in the United States:

Parke, Davis & Co., Detroit, Mich. (license No. 1); H. K. Mulford Company, Philadelphia, Pa. (license No. 2); Lederle Antitoxin

[a] An act regulating the sale of viruses, serums, toxins, and analogous products, etc. Approved July 1, 1902.

New York, N. Y. (license No. 17); New York State health, Albany, N. Y.; and the department of health of the city of New York, N. Y.

HISTORICAL REVIEW.

Compared with the major plagues of man lockjaw has always been a rare disease. It is on account of the peculiar and characteristic spasms that it early attracted attention. In the writings of Hippocrates cases of tetanus are described, diagnosed, and prognosis given. From the learned Aretaeus of Kappadoza we have a description of tetanus that holds until modern times.[a] Aretaeus described an opisthotonos, an emphrothotonos, and a tetanus, depending upon whether the muscles of the back, abdomen or the general muscular system were affected. To this classification pleurothotonos was later added when the muscles of the side were especially affected.

Throughout the Middle Ages knowledge of tetanus remained at a standstill. The symptoms of the disease so plainly indicated that the lesions are located in the nervous system that, with the introduction of studies in pathology, anatomy, the brain, spinal cord, and nerves were studied to find the seat and nature of the illness. It was not, however, until the end of "the sixties" in the last century that experimental studies in wound infections began to throw light upon the chaos of theories. A review of the historical development of these theories is exceedingly interesting, for they mirror the prevailing thought upon the nature of disease, as it developed from that of evil spirits, through the "humoral" theory, the realm of miasm and noxious effluvia, to the germ theory.

It was long known that tetanus was a complication of wounds. Micheles, 1797, thought it was due to irritation of the peripheral nerves from foul secretions in certain wounds ("wound insults"). Tetanus could not escape the rheumatism theory, which has been such an alluring catch-all for symptoms and diseases difficult of explanation. In cases of wound tetanus in which no plausible explanation seemed possible it was called rheumatic wound tetanus. "Taking cold" was assigned its usual rôle here as elsewhere. When no assignable cause seemed at hand the disease was given the learned title "idiopathic tetanus."

About 1860 Heiberg and Rose, and Billroth and Spencer Wells[b] attached tetanus to the list of zymotic diseases and believed it due to a miasm, the spasms being caused by a poison in the blood similar to strychnine.

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[a] A part of the historical data are taken from Von Lingelsheim's article on Tetanus in Kolle & Wassermann's Handbuch der pathogenen Mikroorganismen, vol. 2, p. 566–600.

[b] Billroth and Spencer Wells. Wiener med. Presse, 1869, p. 36.

E. Rose[a] 1870, described a particular form of tetanus following wounds in the area of the twelfth cerebral nerve which he called "head tetanus" or "tetanus hydrophobicus."

An important milestone in the history of tetanus was passed when Strümpell,[b] 1876, declared tetanus to be an infection. The first experiments to prove this view failed.

Arloing and Tripier[c] did not succeed in transferring the disease to dogs and rabbits by carrying over the blood and the pus from tetanus wounds.

Billroth[d] and Schultz[e] also obtained negative results with dogs.

Carle and Rattone,[f] 1884, were the first to obtain positive results in demonstrating the transmissibility of the disease. They injected a number of rabbits with the washings from the neighborhood of an acne pustule from which the tetanus originated. The rabbits were injected either into the sciatic nerve or into the muscles of the back. After an incubation period of two to three days 11 of the 12 rabbits showed typical tetanic spasms. They also succeeded in carrying the infection from animal to animal.

By injecting earth taken from different places into 140 mice, rabbits, guinea pigs, etc., in studying the microorganisms of soil (ground tetanus), Nicolaier,[g] 1884, produced symptoms of tetanus in 69 of them and always found a slender rod in the pus. Therefore he concluded that there exists a bacillus that causes tetanus in deep wounds of mice, rabbits, and guinea pigs. In cultures Nicolaier was unable to separate this bacillus from the other microorganisms with which it was associated, but inoculation experiments with mixed cultures produced tetanus.

The next year (1885) Nicolaier,[h] working under Flügge in the Göttingen Hygienic Institute, made noteworthy advances upon the subject. He showed that each injection into mice, guinea pigs, and rabbits caused a disease with tetanic spasms, while dogs were refractory. Nicolaier saw in the pus of the wounds this slender bacillus,

[a] Nicolaier, Arthur: Zur Aetiologie des Kopftetanus (Rose). Virch. Arch., vol. 128, 1892, p. 1–19.

[b] Strümpell: Ueber die Ursachen der Erkrankungen des Nervensystems. Arch. f. klin. Med., vol. 35, p. 14–15.

[c] Arloing and Tripier: Gaz. med. de Paris, 1870, p. 337.

[d] Billroth: Allgemeine chirurgische Pathologie und Therapie. Berlin, 1882, p. 504.

[e] Schultz: Ueber einer Kumulation von Tetanusfällen im Stadtkrankenhause zu Rostock. Rostock, 1876, p. 13.

[f] Carle and Rattone: Studio sull' enziologia del tetano (communicazione preventiva). Giorn. dell' R. Accad. di med. di Torino, Marzo, 1884.

[g] Nicolaier, Arthur: Ueber infectiosen Tetanus. Deut. med. Woch., vol. 10, 1884, p. 842–844.

[h] Nicolaier, Arthur: Beiträge zur Aetiologie des Wundstarrkrampfes. Inaug. dissertа., Göttingen, 1885.

which he considered the cause of the infection, but again was unable to obtain it in pure culture, although he carried on a mixed culture upon coagulated calf's blood serum.

Soon afterwards Rosenbach,[a] 1886, found a similar bacillus with a round terminal spore in a case complicating frost gangrene in man and transferred the infection to animals in the pus.

In 1889, with the aid of anaerobic technic, Kitasato[b] for the first time grew the bacillus in pure culture and by successful inoculation experiments finally proved that this bacillus was the real cause of tetanus. Kitasato succeeded in isolating the tetanus bacillus, first described by Nicolaier and later by Rosenbach, not alone by understanding anaerobic methods but by taking advantage of its resisting spore. This bacillus appears in the pus of wounds of man and animals having tetanus. It often forms spores in the pus, but if the pus is examined early it may contain spore-free rods. He planted the material containing the bacillus upon agar slants, which were incubated one to two days. The mixed cultures so obtained were heated one hour at 80° C. and then transplanted to agar plates. Kitasato designed for this purpose a special shaped apparatus in which hydrogen was used to replace the air.

Kitasato[c] further showed that the tetanus bacillus is not found in the heart's blood of mice dead of tetanus and therefore concluded that we are dealing with an intoxication and not with an infection.

It was in the following year, 1890, that Behring and Kitasato[d] published their epoch-making work upon the tetanus toxin and tetanus antitoxin, laying the foundation of serum therapy. On account of the great historical and practical importance of this document a transcription of its principal features is given:

The immunity of rabbits and mice which have been immunized against tetanus depends upon the power of the cell-free serum to render the toxic substances which are produced by the tetanus bacillus harmless.

Experiments show:

1. The blood of tetanus immune rabbits possesses the property of destroying the tetanus poison.

2. This property is destroyed by the extravascular blood and the cell-free serum obtained from it.

3. This property is of such a stable nature that it is also effective in the bodies of other animals, so that we are in a position, by means of the transfer of blood serum, to accomplish noteworthy therapeutic results.

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[a] Rosenbach: Zur Aetiologie des Wundstarrkrampfes beim Menschen. Arch. f. klin. Chir., Berl., vol. 34, p. 306–317.

[b] Kitasato, S.: Ueber den Tetanusbacillen. Zeit. f. Hyg., vol. 7, 1889, p. 225.

[c] Kitasato, S.: Experimentelle Untersuchungen über das Tetanusgift. Zeit. f. Hyg., vol. 10, 1891, p. 304.

[d] Behring, E., and Kitasato, S.: Ueber das Zustandekommen der Diphtherie-Immunität und der Tetanus-Immunität bei Theiren. Deut. med. Woch., vol. 16, 1890, p. 1113–1114.

4. The property of destroying the tetanus poison is absent in the blood of animals which have not been immunized against tetanus. If the tetanus poison be given to susceptible animals it may be demonstrated in the blood and other body fluids after the death of the animal.

For instance: A rabbit was immunized against tetanus to such a high degree of immunity that it was able to withstand 10 c. c. of a virulent culture containing the tetanus organism, 0.5 c. c. of which was sufficient to kill a normal rabbit. This rabbit was not only able to withstand the infection of living tetanus bacilli, but was also immune to the tetanus poison. Thus it withstood without any symptoms twenty times the quantity of tetanus poison sufficient to kill a normal rabbit.

This rabbit was bled from the carotid, and before the blood clotted 0.2 c. c. was given to a mouse and 0.5 c. c. to another. After twenty-four hours both of these treated mice and two control mice were inoculated with a virulent tetanus bacillus. The amount injected was so great that the control animals showed tetanus in twenty hours and were dead in thirty-six hours. Both treated mice, on the other hand, remained well.

The larger quantity of blood was allowed to stand until the serum separated. Of this serum six mice were injected with 0.2 c. c. each into the peritoneal cavity. Twenty-four hours later they were infected and remained well, while the control mice died in less than forty-eight hours.

It was further found that the serum had a therapeutic value in that the mice were first infected and afterwards protected by injecting the serum into the peritoneal cavity.

They further made experiments to demonstrate that the serum has an enormous power of destroying the poison.

Of a tetanus culture ten days old which was freed from bacilli by filtration, 0.00005 c. c. was sufficient to kill a mouse in four to six days and 0.0001 c. c. was sufficient to kill a mouse with certainty in two days. However, 5 c. c. of the serum from the tetanus immune rabbit was mixed with 1 c. c. of this culture, and the serum was allowed to act twenty-four hours upon the culture containing the tetanus poison. Of this mixture, four mice were given each 0.2 c. c., containing 0.0033 c. c. of the culture, or more than 300 times the dose otherwise fatal for mice. All four of the mice remained well. The control mice, on the other hand, died in thirty-six hours with 0.0001 c. c. of the fluid. The mice which were treated as above described, as well as those which had received the mixture of tetanus poison with serum, so far as can be told, remained well. Later they were injected repeatedly with virulent tetanus bacilli, which they withstood without a trace of symptoms.

This fact is of very particular note, because in the innumerable experiments no mouse, no rabbit, in fact no animal so far tested has shown a natural immunity against tetanus. We therefore may draw the conclusion that the above-mentioned explanation of the conditions of immunity which may be obtained promptly and without difficulty, and which may be accomplished without harm to the animals in the process of immunization, will prove of far-reaching value. It is to be understood that control animals were tested with the blood and serum of nonimmune rabbits. The same may be said to be true of cattle and sheep.

We permit ourselves from our results to venture the conclusion that, after finding a therapeutically potent substance useful for animals, it will also be useful in the treatment of diphtheria and tetanus in man. We only desire to call attention to one thing in conclusion: In former times the transfusion of blood was considered to be a heroic, but in certain cases a very powerful, curative agent. In later times it was thought that physiological salt solution was able to accomplish the same result. On the other hand, our experience makes memorial the phrase "Blut ist ein ganz besonderer saft."

THE STABILITY OF TETANUS TOXINE.

From a practical standpoint it is important to obtain a stable poison. Herein lies the crux of the problem so far as the standardization of tetanus antitoxin is concerned. Tetanus toxine in solution can not be depended upon. Its strength varies so, that if the soluble poisons are used to measure the value of the antitoxic serums, as is the case with the German method, it is found necessary to redetermine by a series of mice the strength of the toxine each time a serum is tested. Diphtheria toxine in solution, after a period of ripening, comes to a stage of equilibrium and after this period is reached retains its toxicity for a long time. This fact is of signal service in the standardization of diphtheria antitoxin. The fact that tetanus toxine does not exhibit the same constancy in solution has thrown much confusion and no little difficulty into the work of standardizing its antitoxin.

Our first efforts therefore were to obtain a stable poison. In this we fortunately succeeded by precipitating the filtered bouillon culture with ammonium sulphate, drying the precipitate over sulphuric acid, grinding to an impalpable powder, and preserving in vacuo under the influence of pentaphosphoric acid—a very strong dehydrating substance—in a cold, dark place. Under these conditions we have found the dried poison maintains its strength without appreciable alteration at least 25 months, as will be seen by the following table:

TABLE NO. 4.—*The stability of the standard tetanus toxine A.*

Guinea pig No.	Weight in grams.	Date.	Amount toxine subcutaneously.	Time of death.	
			Gm.	*Days.*	*Hours.*
18	355	Mar. 8, 1906	0.000,006	3	0
48	360	Mar. 27, 1906	.000,006	3	11
49	350	.....do.....	.000,006	3	3
63	340	Mar. 31, 1906	.000,006	3	10
64	340	.....do.....	.000,006	3	18
75	325	Apr. 4, 1906	.000,006	2	12
76	325	.....do.....	.000,006	3	5
89	350	Apr. 7, 1906	.000,006	3	11
151	335	June 12, 1906	.000,006	4	12
152	340	.....do.....	.000,006	6	9
153	340	.....do.....	.000,006	6	9
168	310	June 26, 1906	.000,006	3	8
199	330	July 26, 1906	.000,006	5	9
206	325	Sept. 10, 1906	.000,006	3	6
227	350	Nov. 28, 1906	.000,006	4	11
228	350	.....do.....	.000,006	4	0
239	360	Dec. 3, 1906	.000,006	3	14
240	365	.....do.....	.000,006	4	4
245	335	Dec. 5, 1906	.000,006	4	0
246	335	.....do.....	.000,006	7	23
251	395	Jan. 3, 1907	.000,006	3	4
252	395	.....do.....	.000,006	3	12

TABLE No. 4.—*The stability of the standard tetanus toxine A*—Continued.

Guinea pig No.	Weight in grams.	Date.	Amount toxine subcutaneously.	Time of death.	
			Gm.	*Days.*	*Hours.*
257	305	Jan. 5, 1907	0.000,006	2	14
258	315	.....do.....	.000,006	2	13
263	300	Jan. 7, 1907	.000,006	3	20
264	305	.....do.....	.000,006	4	8
395	395	Feb. 20, 1907	.000,006	5	0
404	315	Feb. 25, 1907	.000,006	3	7
411	340	.....do.....	.000,006	4	4
412	320	.....do.....	.000,006	3	17
434	300	Mar. 22, 1907	.000,006	4	17
435	300	.....do.....	.000,006	3	18
458	300	Mar. 28, 1907	.000,006	4	19
459	300	.....do.....	.000,006	4	18
552	320	May 17, 1907	.000,006	4	19
553	330	.....do.....	.000,006	4	10
593	340	June 25, 1907	.000,006	5	14
604	350	July 12, 1907	.000,006	3	4
609	300	July 20, 1907	.000,006	4	8
610	310	.....do.....	.000,006	5	10
629	370	Aug. 29, 1907	.000,006	4	0
630	390	.....do.....	.000,006	4	8
643	325	Sept. 10, 1907	.000,006	5	15
644	330	.....do.....	.000,006	5	8
658	340	Oct. 11, 1907	.000,006	4	0
659	350	.....do.....	.000,006	4	4
663	350	.....do.....	.000,006	4	0
664	355	.....do.....	.000,006	3	12
703	385	Dec. 19, 1907	.000,006	4	20
704	390	.....do.....	.000,006	5	20
729	330	Feb. 10, 1908	.000,006	4	15
730	340	.....do.....	.000,006	3	19
731	340	.....do.....	.000,006	4	9
749	330	Apr. 7, 1908	.000,006	4	0
750	335	.....do.....	.000,006	3	17
751	335	.....do.....	.000,006	4	2
752	340	.....do.....	.000,006	3	23
753	340	.....do.....	.000,006	3	23

It has fortunately developed that this dried poison not only retains its virulence when kept under the exact conditions above mentioned, but loses its toxicity rather slowly when exposed to light, heat, and other influences. One of the sealed tubes sent from Washington to Manila by mail arrived there without appreciable loss of toxicity.

This dried poison, which is distributed to manufacturers and other laboratories engaged in the work of standardizing tetanus antitoxin, is therefore well suited to withstand transportation. We recommend, however, that it always be kept in a vacuum desiccator in a dark, cold place.

The effect of sunlight upon this toxine will be seen in the following tables:

THE STABILITY OF THE STANDARD TETANUS TOXINE.

In the following experiments the toxine (No. A.) was placed in small wide-mouthed vials, loosely stopped with a pledget of absorbent cotton and exposed under the conditions stated in each table. Table No. 4, page 16, shows the stability of this toxine when kept under special conditions and serves as a control for tables 5 to 8.

TABLE No. 5.—*Influence of sunlight.*

[MLD=.000,006 gram.]

Guinea pig No.	Weight in grams.	Date.	Time of death.		Amount toxine subcutaneously.	Remarks.
			Days.	*Hours.*	*Gram.*	
156.....	375	June 23, 1906	6	18	0.000,004	
157.....	385	.....do.....	5	19	.000,005	Exposed 54 minutes to direct sunlight and 60 hours to bright light in front of window.
158.....	400	.....do.....	4	9	.000,006	
159.....	440	.....do.....	4	6	.000,007	
160.....	480	.....do.....	6	8	.000,008	
171.....	320	June 26, 1906	4	2	.000,006	Exposed 54 minutes, again 66 minutes to direct sunlight; and 5½ days bright light in front of window.
172.....	320	.....do.....	4	0	.000,007	
173.....	320	.....do.....	2	20	.000,008	
193.....	310	July 3, 1906	(a)		.000,006	Same toxine exposed 4 times, about 1 hour each, bright sunlight and in front of window, 13 days.
194.....	350	.....do.....	(a)		.000,007,2	
195.....	370	.....do.....	(a)		.000,008,1	
190.....	370	.....do.....	8	21	.000,006	Control. Same toxine kept in vacuum desiccator in dark at 15° C.
191.....	375	.....do.....	6	20	.000,007,2	
192.....	375	.....do.....	5	23	.000,008,1	

[a] Symptoms.

It is evident from the above that two exposures of one hour each to bright sunlight, and five and one-half days to bright light before a window with a southern outlook had no appreciable effect on the dried toxine. However, four exposures of one hour each upon different days to sunlight and thirteen days in bright light slightly diminished the virulence of the poison.

TABLE No. 6.—*Influence of temperature* 37° *C.*

[MLD=0.000,006 gram.]

Guinea pig No.	Weight in grams.	Date.	Time of death.		Amount toxine subcutaneously.	Remarks.
			Days.	*Hours.*	*Gram.*	
161.....	375	June 23, 1906	5	20	0.000,004	60 hours at 37° C.
162.....	410	.....do.....	6	1	.000,005	Do.
163.....	480	.....do.....	5	15	.000,006	Do.
164.....	480	.....do.....	6	15	.000,007	Do.
165.....	490	.....do.....	6	6	.000,008	Do.
174.....	320	June 26, 1906	5	1	.000,006	5¼ days at 37° C
175.....	320	.....do.....	5	1	.000,007	Do.
176.....	375	.....do.....	4	4	.000,008	Do.

TABLE No. 6.—*Influence of temperature* 37° *C.*—Continued.

Guinea pig No.	Weight in grams.	Date.	Time of death.	Amount toxine subcutaneously.	Remarks.
			Days. Hours.	*Gram.*	
196	300	July 3, 1906	(a)	0.000,006	13 days at 37° C.
197	345	.....do.....	(a)	.000,007	Do.
198	360	.....do.....	(a)	.000,008,1	Do.
217	300	Sept. 25, 1906	(b)	.000,006	97 days at 37° C.
218	325	.....do.....	(b)	.000,007,2	Do.
219	330	.....do.....	(b)	.000,009	Do.
220	340	.....do.....	(b)	.000,009,9	Do.
221[c]	340	.....do.....	2 14	.000,012	Do.[c]
222	350	.....do.....	(b)	.000,012,9	Do.
223	360	.....do.....	(b)	.000,014,1	Do.
224	390	.....do.....	(d)	.000,015	Do.
225	350	Nov. 28, 1906	3 14	.000,004,2	Control; toxine kept under vacuum at 15° C.
226	350	.....do.....	4 4	.000,005,1	Do.
227	350	.....do.....	4 11	.000,006	Do.
228	350	.....do.....	4 0	.000,006	Do.
229	350	.....do.....	3 16	.000,007,2	Do.
230	350	.....do.....	3 19	.000,008,1	Do.

[a] Symptoms.
[b] Slight symptoms.
[c] No tetanic symptoms; died of pneumonia.
[d] Marked symptoms.

An exposure of five and one-half days at 37° C. in the incubator had no apparent effect upon the toxine. After ninety-seven days under the same conditions the poison had lost some of its toxicity.

TABLE No. 7.—*Influence of room temperature, diffuse light, etc.*

[MLD=.000,006 gram.]

Guinea pig No.	Weight in grams.	Date.	Time of death.	Amount toxine subcutaneously.	Remarks.
			Days. Hours.	*Gram.*	
231		Nov. 30, 1906	(a)	0.000,005	163 days in open vial, dark closet, room temperature (June 20 to Nov. 30, 1906).
232		.....do.....	11 13	.000,006	
233		.....do.....	6 18	.000,007	
234		.....do.....	6 14	.000,008	
235		.....do.....	6 15	.000,009	
236		.....do.....	6 23	.000,01	
577	320	June 18, 1907	(b)	.000,01	363 days in open vial, dark closet, room temperature (June 20, 1906, to June 18, 1907).
578	370	.....do.....	(c)	.000,02	
579	370	.....do.....	(c)	.000,04	
580	375	.....do.....	5 12	.000,06	
581	385	.....do.....	4 2	.000,08	
582	400	.....do.....	3 21	.000,1	

[a] Slight symptoms.
[b] No symptoms.
[c] Symptoms.

The standard toxine under these conditions has shown marked stability. After a sojourn of one year (363 days) in a dark closet, at room temperature, it lost in virulence. It will be recalled that the poison was kept in an open vial, loosely stoppered with absorbent cotton, so that it had free access to the oxygen and moisture of the air.

TABLE No. 8.—*Influence of diffuse light, etc.*

[MLD=0.000.006 gram.]

Guinea pig No.	Weight in grams.	Date.	Time of death.		Amount toxine subcutaneously.	Remarks.
			Days.	*Hours.*	*Gram.*	
204.....	360	July 26, 1906	[a]		0.000.006.1	36 days at room temperature in diffuse light.
205.....	375	.....do.....	4	17	.000.009	
206.....	375	.....do.....	5	17	.000.009.9	
207.....	375	.....do.....	6	3	.000.011.1	

[a] Symptoms.

From this single experiment it will be seen that the toxine exposed to diffuse light at room temperature diminished slightly in toxicity after thirty-six days of such exposure.

It is therefore evident that the dried poison, which we use for the purpose of standardizing tetanus antitoxin, has sufficient stability for practical purposes.

The work of other investigators upon the stability of tetanus toxine and the influence of chemical agents are briefly abstracted in the following:

The first exact work upon the stability of tetanus toxine was done by Kitasato [a] in 1891. This pioneer paper contains an extensive series of tests upon the poison, showing the influence of physical agents and a long list of chemical substances. Kitasato found that the filtrate of tetanus cultures is very sensitive to heat; 65° C. and above is sufficient to destroy it within a few minutes (5 minutes and less). It will sometimes withstand 60°C. for fifteen minutes, but is destroyed at 60° C. for twenty minutes.

It retained its toxic properties when heated an hour and a quarter at 55° C., but lost its power after one and a half hours.

The filtrate of tetanus culture may be dried and retain its toxicity, but this depends upon the manner in which the drying is carried out. In the dessicator over sulphuric acid the filtrate does not lose its properties. The same may be said if it is dried in the air at room temperature, although it is somewhat weakened.

On the other hand, the filtrate was totally destroyed if it is dried in the incubator. The filtrate gradually loses its strength at a temperature of 35° to 37° C.

[a] Kitasato, S.: Experimentelle Untersuchungen über das Tetanusgift. Zeit. f. Hyg., vol. 10, 1891, p. 267–305.

The filtrate placed in the window in diffuse light gradually lost its properties. It lasted, however, a long time before it was entirely destroyed. After it had been nine or ten weeks at the window it was still toxic, but in large doses.* The filtrate kept cold in a dark room retained its toxic properties much longer, for after three hundred days it was still equally as toxic as when fresh.

Direct sunlight totally destroys the tetanus poison in from fifteen to eighteen hours.

Diluting the poison with water or bouillon does not seem to harm it in any way.

Hydrochloric acid influences the tetanus poison when added in the proportion of 0.55 per cent within one hour, and in the amount of 0.1365 per cent within twenty-four hours completely destroys the poison.

From similar experiments with many chemical substances Kitasato drew the conclusion that the tetanus poison is very susceptible to acids, especially mineral acids, as well as alkalies.

Tizzoni and Cattani,[a] 1891, have shown that silver nitrate, sublimate, and hydriodic acid alter the toxicity of filtered tetanus cultures; carbolic acid, chlorine water, and iodidum trichloride were also found to have the same effect. Tizzoni and Cattani had much difficulty at first in immunizing animals with large doses of the tetanus toxine in order to obtain potent antitoxin. On account of the virulence of the poison many animals were sacrificed. They found that treating the toxine with iodine trichloride was useful in order to weaken the poison, and thus permit the use of large doses, which could then be rapidly increased.

Vaillard and Vincent,[b] 1891, showed that the tetanus toxine is modified or destroyed by temperatures exceeding 65° C. It is considerably attenuated when heated in a closed flask for forty minutes at 60° C. or twenty minutes at 62° C. Heating for thirty minutes at 65° C. in closed flasks renders it inactive. Kept in a closed flask free from air and light the liquid toxine keeps its activity for a long time; after four months there is no change in its toxicity. Exposed to the air in a thin layer it loses its activity after a month; this action is more rapid and greater in sunlight.

Acidification of the liquid by tartaric acid does not modify its toxicity. It can be dried in a vacuum over H_2SO_4 and is extremely toxic.

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[a] Tizzoni, G., and Cattani, Giuseppina: Ueber die Eigenschaften des Tetanus-Antitoxins. Centblt. f. Bakt., Ref., vol. 9, 1891, pp. 189, 685.

[b] Vaillard, L., & Vincent, H.: Contribution a l'étude du tétanos. Ann. Inst. Pasteur, vol. 5, 1891, p. 1.

Tetanus toxine is insoluble in alcohol. It is precipitated by phosphate of lime or of aluminum; retains its toxicity for a long time; it resists well in this state the action of the air.

Vaillard and Rouget [a] proved that the heating at 65° to 67° C. for five, ten, or fifteen minutes diminishes considerably but does not destroy the toxine. When heated ten or fifteen minutes to 70° or 75° C. and one hour at 80° C. if injected in very large amounts is toxic for guinea pigs. They showed that the spores contained a certain amount of toxine which resisted 80° C. for one hour.

Martin [b] also showed that the toxine is very sensitive to heat; 65° C. or above for five minutes completely destroys it; but it withstands 60° C. for fifteen minutes and 55° C. for an hour and a quarter; much longer at lower temperatures. He dried it over H_2SO_4 without loss of toxicity. If dried in the incubator it loses its toxicity. It was destroyed in nine or ten weeks by diffused daylight; fifteen to eighteen hours direct sunlight completely destroys it.

Lumière and Chevrottier [c] found that solutions of permanganate of potash and sulphate of iron, and the salts of cerium, cobalt, and nickel markedly attenuate the toxine of tetanus.

Fermi and Pernossi [d] draw the following conclusions from their studies of the tetanus poison:

Agar cultures are the most poisonous. Next come those on gelatin, and lastly those in bouillon. Chickens, snakes, turtles, and tritons are immune to the poison. In the above-mentioned animals this toxine may remain and retain its virulence for three days, and even longer. Filtrates from agar and gelatin cultures are more resistant to heat than those from bouillon. Like the enzymes, the purer the tetanus poison the less stability does it possess. Dissolved in water, the tetanus poison is rendered inert by a temperature of 55° C., but in the dry state it can be heated to 120° C. without loss of virulence. When the dry poison is mixed with ether or chloroform and heated to 80° C. it is destroyed; but with amylic alcohol or benzol a temperature of 100° is required to accomplish this result. Dissolved in water this poison is destroyed by direct sunlight after

[a] Vaillard, L., & Rouget, J.: Contribution a l'étude du tétanos. Ann. Inst. Pasteur, vol. 6, 1892, p. 385.

[b] Martin, S.: Further report on the chemical pathology of tetanus. Report of med. officer, Local Govt. Board, London, 1894-5, vol. 24, 1896, pp. 505-513.

[c] Lumière, A. & L., & Chevrottier, J.: Action des oxydases artificielles sur la toxine tétanique. Compt. rend. acad. sci., vol. 138, 1904, pp. 652-654.

[d] Fermi, Cl., and Pernossi, Leone: Ueber das Tetanusgift. Vergleichende Studien mit Berücksichtigung anderer, Gifte und der Enzyme. Centblt. f. Bakt., 1 Abt., vol. 15, 1894, pp. 303-310. Ref., Vaughan & Novy's "Cellular toxins," 1902, p. 62-63.

an exposure of eight to ten hours (with the highest temperature on a blackened thermometer at 56° C.) and after fifteen hours when the temperature does not exceed 37° C. In the dry state the tetanus poison can be exposed to the direct sunlight for one hundred hours without loss of virulence. Under the action of an electric current of 0.5 ampere, continued for two hours, the substance becomes inert. Gastric juice destroys the poison through the activity of the hydrochloric acid and not by virtue of the pepsin. Ptyalin, diastase, and emulsin have no action on it. The effect of trypsin has not been satisfactorily determined. Putrefactive germs do not destroy the poison. The living, but not the dead, intestines of guinea pigs and cats destroy its toxicity. The poison may be eliminated by the kidneys and retain its properties in the urine; it is not a ferment.

Ritchie [a] states that tetanus toxine under the influence of hydrochloric acid loses with comparative readiness its virulently poisonous properties. It does not, however, so readily lose its capacity of producing immunity, and when all trace of toxicity has disappeared the capacity of producing immunity still remains. The less poisonous substances produced in the modified toxine are probably of the nature of toxoids.

Tetanus toxine is also susceptible to the action of alkalies, such as sodium hydrate and sodium carbonate, under which it loses its toxicity.

Noguchi,[b] 1907, found that eosin, if present in cultures containing tetanus spores, prevents the germination of these spores when its concentration (in glucose bouillon) reaches 0.2 per cent.

The toxine production of tetanus bacilli grown in eosinized culture media diminishes as the concentration of the eosin increases. This effect is brought about partly by the restraining action of the dye on vegetation and partly by its detoxicating action upon the poison.

The toxine-producing power and the virulence of tetanus bacilli are not permanently modified by contact with eosin for a long period or by successive cultivations in eosinized media.

Burckhard[c] found that formalin when added to tetanus toxine in the proportion of 1 to 250 was sufficient to protect a mouse against a dose of tetanus toxine which caused the death of the control in twenty-four hours. Burckhard does not seem to have determined the fatal dose of his tetanus toxine.

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[a] Ritchie, James: Artificial modifications of toxins with special reference to immunity. Journ. hygiene, vol. 1, 1901, pp. 125–144.

[b] Noguchi, Hideyo: The nature of the antitetanic action of eosin. Journ. exper. med., vol. 9, no. 3, May 25, 1907, pp. 281–290.

[c] Burckhard, G.: Zwei Beitrage zur Kenntniss der Formalinwirkung. Centblt. f. Bakt., 1 Abt, vol. 18, 1895, pp. 257–264.

One of us (Anderson),[a] 1907, found that when tetanus toxine is exposed to 5 per cent formalin for six hours a guinea pig is able to withstand 100 MLD of this formalinized toxine. Three per cent formalin after twenty-four hours' exposure protects against the toxine; it destroys a part of the toxine in one hour, its action increasing with the length of exposure.

THE TETANUS TOXINE.

On account of its virulence, its solubility, and the characteristic contractions which it induces the poison of tetanus has been a convenient and favorite subject of investigation. It was the first of the bacterial toxines to give fruitful results in the realm of serum therapy.

Tetanus toxine is readily soluble in the medium in which the culture grows whether fluid or solid. We shall presently see that the filtered culture, called the "tetanus toxine," is really a complex substance, containing various poisons and other bodies.

The particular poison that concerns us especially is the *tetano-spasmine*, which produces the convulsions characteristic of the disease. This poison is a type of a true toxine. It is readily rendered inert by heat, contains both a toxophore and a haptophore group, induces antibodies when introduced into susceptible organisms, and produces symptoms only after a definite period of incubation. Its poisonous action is destroyed by the digestive juices. In all these characteristics tetanus toxine resembles diphtheria toxine. It is one of the most poisonous substances known. As small an amount as 0.000,006 gram of our standard precipitated toxine invariably kills a guinea pig weighing 350 grams. As the precipitate consists mostly of albumins, peptone, amido acids, volatile substances, ammonium sulphate, and other salts it will be seen that but a small proportion of the weight consists of pure poison. Our standard toxine is by no means as strong as other tetanus poisons that have been prepared.

Brieger and Cohn[b] found their strongest tetanus poison killed mice weighing 15 grams when given subcutaneously in doses of 0.000,000,05 gram; smaller doses, such as 0.000,000,01 gram, caused more or less tetanic symptoms in mice. If 0.000,000,05 gram kills a mouse weighing 15 grams Brieger and Cohn calculate that 0.000,23 gram would be a fatal dose for a man weighing 70 kilograms.

Tetanus toxine is not equally toxic for all species of animals. On the other hand, there is an extraordinary constancy in its toxicity

[a] Anderson, John F.: The antiseptic and germicidal properties of solutions of formaldehyde and its action upon toxines. Hyg. Lab. Bull. No. 39, U. S. Pub. Health and Mar. Hosp. Serv., Wash., 1907, pp. 47. 8°.

[b] Brieger, Ludwig, and Cohn, Georg: Untersuchungen das Tetanusgift. Zeit. f. Hyg., vol. 15, 1893, pp. 1–10.

upon individuals of the same species. The same quantity of poison per gram weight of a particular animal always produces similar results.

In 1893 Wladimiroff [a] conducted under Behring's direction a series of experiments to determine the minimal fatal dose for various species of animals. Considering the susceptibility to tetanus toxine for mice as 1, we have the following results. The minimal fatal dose is calculated to the body weight:

Animal species.	Minimal fatal dose.	Susceptibility.
White mice	1 : 500.000	1
White rats	1 : 50,000	0.1
Guinea pigs	1 : 1,000,000	2
Rabbits	Greater than 1 : 24,000	Considerably less than $\frac{1}{10}$.
Goats	1 : 250.000	About $\frac{1}{2}$.

Expressed in figures of minimal lethal doses for the above-mentioned animals we have the following:

Animal species.	Minimal fatal dose.	Minimal fatal dose expressed in minimal fatal dose for mice.
White mice	0.00004	1
White rats	0.004	100
Guinea pigs	0.0002	5
Young goats	0.1	25.000
Medium size rabbits	5.0	125.000

According to Behring, 1 minimal lethal dose per mouse is equivalent to 12 for a horse, 6 for a guinea pig, $\frac{1}{2}$ for a goat, $\frac{1}{150}$ for a rabbit, $\frac{1}{1000}$ for a goose, $\frac{1}{4000}$ for a pigeon, and $\frac{1}{30000}$ for a chicken. That is, the horse is 12 times as susceptible as the mouse, and the mouse is 30,000 times more susceptible than the chicken.

Knorr [b] in his paper on the subject gives a scale of susceptibility to tetanus poison. He finds the horse to be the most susceptible animal. If we take the dose that kills 1 gram of horse as unity, the amounts of poison required by the following animals is as follows:

1 gram of guinea pig	2 times as much
1 gram of goat	4 times as much
1 gram of mouse	13 times as much
1 gram of rabbit	2,000 times as much
1 gram of hen	200,000 times as much

[a] Wladimiroff. A.: Ueber die Antitoxinerzeugende und immunisirende Wirkung des Tetanusgiftes bei Thieren. Zeit. f. Hyg., vol. 15. 1893. pp. 405–422.

[b] Knorr: "Das Tetanusgift und seine Beziehg. zum tier. Organismus," Münch. med. Woch., 1898, 321, 362.

There is always a period of incubation in the animal organism. The duration of this period varies with the species. As a rule, the period of incubation is shorter the more susceptible the animal and the higher the dose. According to Behring:

	Incubation (hours).
13 lethal doses per gram, mouse	36
110 lethal doses per gram, mouse	24
333 lethal doses per gram, mouse	20
1,300 lethal doses per gram, mouse	14
3,600 lethal doses per gram, mouse	12

The period of incubation is never shorter than eight hours.

We have found in the guinea pig that the period of incubation varies inversely with the size of the dose; that is, within certain limits the larger the dose the shorter the period of incubation. This period may vary from about eighteen hours to about five days.

We have found that there is a direct relation between the period of incubation and the severity of symptoms in guinea pigs. Guinea pigs that show symptoms within forty-eight hours after injections of tetanus toxine (either M. L. D. or L+) invariably die. Guinea pigs that show symptoms on the third day usually die, a very small percentage recovering. The longer the onset of symptoms is delayed, the milder the disease and the greater the chances of recovery. These statements are based upon a tabulation of 600 serial cases.

Tetanus toxine is harmless when given by the mouth. It is not absorbed from the intact intestinal tract and is destroyed by the digestive juices.

As a result of work upon guinea pigs, Ransom [a] concluded that tetanus toxine, even in very large doses, is harmless so long as the intestinal tract is intact; that the poison is not absorbed either from the stomach or from the intestines, and in consequence neither the poison nor its antitoxine appears in the blood; and, finally, that the poison is not destroyed in the intestinal canal, but flows through the entire canal and is thrown off *per anum*.

Carrière, however, and several other investigators were unable to detect any toxine in the excreta after the introduction of large doses of toxine by the mouth.

Carrière [b] accordingly made experiments to determine where tetanus toxine became innocuous. He found that the poison was attacked even by the saliva diastase, that pepsin was less injurious, that trypsin had considerable action upon it, and that bile in large quantity completely destroyed it. He could not detect any influence of the intestinal mucous membrane and the intestinal bacteria upon

[a] Ransom, F.: Das Schicksal des Tetanusgiftes nach seiner intestinalen in den Meerschweinorganismus. Deu. med. Woch., vol. 24, 1898, pp. 117–118.

[b] Carrière: "Toxines et digestion." Ann. Past., xiii, 435, 1899 (gives a bibliography of the subject), cf. the General Part.

the poison, although Fermi and Pernossi had found it to be very pronounced. Nencki and Schoumow-Simanowski[a] assert that the digestive fluids render it completely innocuous, notably the bile in conjunction with the fluid from a pancreatic fistula, while trypsin alone has less effect, being less injurious than pepsin. Vincenzi,[b] on the other hand, states that *normal* bile has hardly any destructive influence, but that the bile of animals infected with tetanus has a slight effect under certain conditions; thus, for example, death inevitably follows in three to four days when the bile is active. On the other hand, the poison is somewhat weakened by the *oxydase* of the leucocytes, and, according to Sieber,[c] is completely destroyed by the oxydase of the spleen.[d]

We have fed guinea pigs as much as 24,000 and mice 18,000 times the M. L. D. of tetanus toxine (if injected subcutaneously) without producing any apparent ill effects.

Up to the present time all attempts to isolate the specific toxine as a definite chemical compound have proved unavailing; we are totally ignorant of its chemical nature. Animal experiments are the only real agents by which it may be recognized. By this means we are enabled to determine not only the presence of the poison, but also to estimate its concentration in a solution and to follow its changes.

Before the tetanus bacillus was obtained in pure culture the chemical nature of the toxine was studied by Brieger from mixed cultures in meat broth obtained from Nicolaier and Rosenbach. In 1886 Brieger[e] isolated from such a contaminated growth a basic substance or ptomaine which he called *tetanine* ($C_{13}H_{30}N_2O_4$), and which caused muscular contractions when injected into mice.

Shortly afterward Brieger[f] obtained another ptomaine which he named *tetano-toxine* ($C_5H_{11}N$). He believed these to be the true poison of tetanus. These are now only of historical interest.

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[a] Nencki and Schumow-Simanowski: "Ueber die Entgiftung der Toxin durch die Verdauungssäfte." Centralb. f. Bakt., xxiv, 84, cf. Dzierzgowski and Sieber, Archiv des Siences Biol. de St. Petersb., viii

[b] Vincenzi: "Ueber antitoxische Eigenschaften der Galle tetanisierter Tiere." Deutsch. med. Woch., 1898, 534.

[c] Sieber: "Ueber d. Entgiftung der Toxin durch die Superoxyde, etc." Z. f. phys. Ch., xxxii, 573, 1901.

[d] Toxines and Antitoxines; Oppenheimer, Carl, trans. by C. Ainsworth Mitchell. Charles Griffin & Co., Ltd., London, 1906, p. 110.

[e] Brieger, L.: Ueber ein neues Krämpfe verursachendes Ptomain. Berichte d. deut. chem. Gesellsch., vol. 19, Dec. 9, 1886, p. 3119.

[f] Brieger, L.: Zur Kenntniss der Aetiologie des Wundstarrkrampfes, nebst Bemerkungen über das Choleraroth. Deut. med. Woch., vol. 13, 1887, p. 303.

———: Ptomaine. 3 bd., 1886, p. 89.

———: Ueber ein neues Krämpfe verursachendes Ptomain. Berichte d. deut. chem. Gesellsch., vol. 19, 1886, p. 3119.

Knud Faber,[a] in 1890, first succeeded in demonstrating by physiological tests upon animals the poison in the filtrate of mixed cultures; but exact work upon the toxine dates from Kitasato's anærobic method, in 1889 and 1891, of growing the tetanus bacillus in pure culture upon solid and fluid media.

Brieger's experiments were repeated by Kitasato and Weyl[b] in 1890 with pure cultures of tetanus. From their studies they concluded that Brieger's tetanin, etc., did not produce the characteristic symptoms of tetanus in experimental animals.

Brieger and Fränkel,[c] in 1890, in further experiments believed the tetanus toxine, as well as the poisons produced by the whole order of important pathogenic micro-organisms, to be "toxalbumins." Brieger and Fränkel's toxalbumin consisted practically of an alcoholic precipitate from filtered broth cultures and was undoubtedly toxic.

Hayashi[d] concludes, from his work upon the subject, that the toxine isolated according to the Brieger-Boers method, as well as by his own modification, shows a definite albumin reaction. However, this is not proof that the toxine is a proteid.

The powerful action of tetanus poison in minute amounts, its thermolability, and the period of incubation lend countenance to the view that the toxine may be a ferment. But ferments continue to act when the products of fermentation are removed. This has not been shown to be the case with tetanus toxine. Many of the higher albuminous substances are also readily destroyed by heat lower than 65° C., which is fatal for the tetanus toxine. The period of incubation is now explained by the time necessary for the poison to travel up the motor nerves to the centers. There is, therefore, nothing but analogy of an indefinite nature to class tetanus toxine with the ferments.

Ehrlich,[e] in a parallel work to his researches upon the constituents of the diphtheria toxine, showed that the tetanus toxine contains both a toxophore and a haptophore group, and that the antitoxic immunity is explained by the presence of free receptors in the blood of immunized animals. The receptors combine directly with the haptophore group, thus neutralizing the toxine.

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[a] Feber, Knud: Die Pathogenese des Tetanus. Berl. klin. Woch., vol. 27, 1890, pp. 717–720.

[b] Kitasato, S., and Weyl, Th.: Zu Kenntniss der Anaeroben. Zeit. f. Hyg., vol. 8, 1890, pp. 41, 404.

[c] Brieger, L., and Fränkel, Carl: Untersuchungen über Bakteriengifte. Berl. klin. Woch., vol. 27, 1890, p. 268.

[d] Hayashi, H.: Weitere Forschungen über die chemische Natur des Tetanustoxins. Arch. exper. Path. u. Pharm., vol. 47, 1901–1902, pp. 9–18.

[e] Ehrlich, P.: Die Werthbestimmung des Diphtherieheilserums. Klin. Jahrb., 1897.

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Ehrlich,[a] 1898, definitely proved that tetanus toxine contains at least two poisons—(1) *tetano-lysin* and (2) *tetano-spasmin*. He showed that these two poisons do not always appear in the same relative proportion in different preparations. Some of the toxines that have strong tetanic properties have weak hemolytic action, and *vice versa*. The hemolytic affinity of the toxine weakens much quicker than the tetano-spasmin. This occurs spontaneously as well as when it is heated to 50° for twenty minutes. The two poisons have different combining affinities. If tetanus toxine is brought into contact with red blood corpuscles, the greatest part of the tetanolysin is bound by the red corpuscles, while the tetanospasmin remains in the solution. Each one of these two poisons has its own antitoxin. If several different tetanus sera are examined, it will be found that they have no parallel neutralization for tetanolysin and tetanospasmin. In one particular case Ehrlich found a serum that was strongly antispastic and had practically no antilytic power.

Madsen,[b] 1899, confirms Ehrlich's observations that in cultures of the tetanus bacillus there are two poisons, namely, tetanolysin and tetanospasmin, and that for the former there exists a specific antitoxin, namely, antilysin. The strength of this lysin and its antibodies may be measured with great accuracy by colorimetric tests.

Knud Faber,[c] in his early work with mixed cultures in 1890, was the first to obtain indications of the true tetanus poison.

Faber showed that the poison always works after a certain period of incubation. The greater the quantity of poison the shorter the period of incubation and the shorter the course of the disease. For instance, when the period of incubation was twenty-four hours, rabbits died after a sickness of twenty-four hours; but if the period of incubation was five days, then the rabbits recovered after localized tetanus lasting fourteen days. With mice the period of incubation varied from six hours to two to fifteen days.

He found that the poison is active not only when injected into the tissues, but also when injected intravenously in rabbits. Positive results were obtained with mice, rats, guinea pigs, rabbits, and birds, but frogs were not affected.

He was not able to obtain an immunity by using the filtered cultures. The poison passes through a Chamberland filter. All traces of toxicity disappear if the poison is heated for five minutes at 65° C. Faber states that experimental tetanus in smaller animals always manifests itself by local cramps. This is the case whether the toxine

[a] Ehrlich, P.: Gesellschaft der Charité-Aertze (Sitzung 3. Februar 1898). Berl. klin. Woch., 1898, no. 12.

[b] Madsen, Thorvald: Ueber Tetanolysin. Zeit. f. Hyg., vol. 32, 1899, pp. 214, 239.

[c] Faber, Knud: Die Pathogenese des Tetanus. Berl. klin. Woch., vol. 27, 1890, pp. 717–720.

or a bacterial culture is used; so that we must conceive that the disease spreads in and around the wound, working upon the motor nerve endings (?). The general spasms are produced by the introduction of the poison into the blood.

In 1891 Kitasato,[a] working under Koch's directions, published his classical paper upon tetanus toxine. The toxine was readily obtained in any desired amount by simply filtering pure cultures of the organism.

Of the three species of animals used in these experiments—mice, guinea pigs, and rabbits—Kitasato found that guinea pigs are most susceptible to tetanus toxine; then follow mice, and finally rabbits. The symptoms of tetanus in all three animals injected with the filtrate appear at the latest in three days. If the animals remain well for four days they will not sicken with tetanus.

The tetanus toxine appears in the blood and there produces its toxic properties. The blood itself is sterile, and therefore it is a toxic and not a bacterial result. The bouillon must be neither acid nor strongly alkaline, but about neutral or have a weak alkalinity; and, secondly, it must always be freshly prepared.

Meyer[b] injected dogs and cats with tetanus toxine into the spinal cord and found the condition known as tetanus dolorosus. This is never found in any other method of tetanus poisoning. By injecting the posterior roots of the spinal cord in the lumbar region Meyer obtained a pure tetanus dolorosus without muscular contractions.

Bolton and Fisch[c] have shown that the toxine makes its appearance in the blood of the horse several days before any symptoms of tetanus are to be observed, and that it gradually increases until about two days before symptoms become noticeable, and then it suddenly diminishes, and even disappears in some cases. The amount of toxine varies considerably in different cases. In one instance the serum from a diphtheria antitoxin horse about two days before symptoms of tetanus appeared was sufficient to kill a guinea pig in the dose of 0.1 c. c. The fact that tetanus toxine may appear in such large quantities in the blood without symptoms of tetanus is of very great practical importance in the production of both diphtheria and tetanus antitoxins.

Von Lingelsheim[d] recommends that in order to obtain strong tetanus toxines only those cultures which are strictly anaërobic should be

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[a] Kitasato, S.: Experimentelle Untersuchungen über das Tetanusgift. Zeit. f. Hyg., vol. 10, 1891, pp. 267–305.

[b] Meyer, Hans: Ueber motorischen und dolorosen Tetanus. Sitzber. d. Gesellsch. z. Bef. d. Naturw., Marburg, 1902, pp. 1–6.

[c] Bolton, B. Meade, and Fisch, Carl: An estimate of the amount of toxine in the blood of horses infected with tetanus. Trans. Assn. of Am. Phys., vol. 17, 1902, pp. 462–467.

[d] Von Lingelsheim, W.: Das Tetanusgift. Kolle & Wassermann's Handbuch der Bakterien, Bd. 2, p. 589.

used. According to Debrand,[a] the strongest poisons may be obtained by symbiosis with *B. subtilis*. The best medium is a weak alkaline bouillon with 1 per cent peptone and 0.5 per cent salt. The addition of glycerin and grape sugar is to be avoided, as the acids produced by their decomposition have an injurious effect upon the toxine. Tizzoni obtained good results by the addition of gelatin to the culture medium. It is most important to have a culture which is a good toxine producer, just as in the case of diphtheria. It seems that the strongest poisons are obtained after a term of from six to eight days in the incubator. By observing the proper conditions it seems comparatively easy to obtain cultures that will kill a mouse weighing 15 grams in a dose of 0.000005 gram. Most of those who have worked much in this subject have experienced at times difficulty in obtaining strong tetanus toxine; not all of the factors involved are understood.

It is noteworthy that the strength of the toxine produced is greater in contaminated cultures than in pure cultures. In the Marburg Institute of Hygiene and Experimental Therapy, presided over by Behring,[b] the strongest tetanus toxines have been obtained from mixed cultures. The first work, it will be remembered, upon the tetanus toxine by Faber, Brieger, Fraenkel, Nicolaier, and Rosenbach was with impure cultures.

Uschinsky [c] cultivated tetanus bacilli on a proteid-free medium of the following composition:

Water	1,000
Glycerin	30 to 40
Sodium chloride	5 to 7
Calcium chloride	0.1
Magnesium sulphate	0.2 to 0.4
Dipotassium hydrogen phosphate	2 to 2.5
Ammonium lactate	6 to 7
Sodium aspartate	3.4

preferably with the addition of 1 to 2 per cent of grape sugar. The air was excluded by means of liquid paraffin.

According to Buchner,[d] Tizzoni and Cattani, following the plan of Brieger and Fränkel, were the first to succeed in obtaining a dried poison with the use of ammonium sulphate.

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[a] Debrand, L.: Sur un nouveau procédé de culture du bacille du tetanos. Ann. d. Inst. Pasteur, vol. 14, 1900, pp. 757–768.

[b] v. Behring, E.: Aetiologie und aetiologische Therapie des Tetanus. Beitr. z. exper. Therapie, vol. 7, 1904, pp. 1–72.

[c] Uschinsky, "Ueber eine eiweissfreie Nährlosung f. pathog. Bakt." Cantralb. f. Bakt., vol. 14, 1893, p. 316.

[d] Buchner, H.: Erwiderung betreffend das trockene Tetanusgift. Deut. med. Woch., vol. 20, 1894, p. 179.

Brieger and Fraenkel,[a] however, call attention to the fact that in 1890, in the Berliner klinische Wochenschrift, No. 11, page 612, they describe a process for obtaining a dried tetanus poison and experiments with the same.

Whoever owns priority, the method is a very good one, and with it we have succeeded in obtaining strong and stable poisons.

MODE OF ACTION OF TETANUS TOXINE.

For a full understanding of the problem with which we are dealing it is important to have a clear conception of the way in which the tetanus toxine exerts its poisonous effects upon the body. Therefore the following review of the literature upon this question has been introduced.

It has been known since ancient times that tetanus toxine affects chiefly the central nervous system, but it is only comparatively recently that it has been experimentally demonstrated in what way the toxine reaches the nervous centers.

Gumprecht[b] first showed with some degree of certainty that the toxine attacks particularly the spinal cord and that the phenomenon of the disease depends upon this cord poisoning.

Bruschettinni,[c] 1892, demonstrated the presence of the toxine in the central and peripheral nervous system after subcutaneous inoculation. He also showed it to be present in the blood, but that the other organs were free from it.

Brunner,[d] 1892, in experiments upon guinea pigs and rabbits, found that the tetanus poison was not able to cause the tetanic contractions when placed directly upon the muscle substance. After paralysis of the motor nerve terminals by curare the tetanus contractions ceased. He found, however, that the tetanus toxine is not able to cause spasms in a muscle area the motor nerve of which has been severed from its center. In view of the first fact, it followed that a motor nerve severed from its center is not able to produce tetanus contractions.

Brunner further concluded that the poison was able to induce tetanic spasms in the muscles of a particular nerve area only when the paths to the corresponding nerve centers are intact.

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[b] Brieger, Ludwig, and Fraenkel, Carl: Herr Buchner und das trockene Tetanusgift. Deut. med. Woch., vol. 20, 1894, p. 118.

[b] Gumprecht: Versuche über die physiologische Wirkung des Tetanusgiftes im Organismus. Arch. f. Physiol.

[c] Bruschettinni, Alessandro: Sulla diffusione del veleno del tetano nell'organismo. La riforma med., vol. 8, part 3, 1892, pp. 256–259.

[d] Brunner, Conrad: Zur Pathogenese des Kopftetanus. Berl. klin. Woch., 1891.

———: Die bisherigen Resultate experimenteller Untersuchungen über die Art der Wirkung des Tetanusgiftes auf das Nervensystem. Deut. med. Woch., vol. 20, 1894, pp. 100–103.

Vaillard and Vincent,[a] 1890, had already shown that the contractions in a particular innervation of the area disappeared when such an area was cut off by section of the cord.

Knorr,[b] 1897, as a result of his work, concluded that:

Pure tetanus poison has a strong affinity for some unknown substance in certain of the body cells. The amount of this affinity is as the degree of susceptibility of animals (that have not previously been treated) for the poison.

The antitoxin has the same property of combining with the toxine as has the above-mentioned unknown substance.

In the culture media of tetanus bacilli there are also sometimes found bodies that have an affinity for the poison.

The combination of the poison with all of these substances is slow. The rapidity depends upon the degree of the affinity and the concentration, and other conditions surrounding the poison.

For every animal species the dose most favorable for the production of antitoxin seems to be slightly less than that necessary to make the animal sick. Doses that are much smaller are not effective. Doses that are considerably higher interfere with the production of antitoxin. The production of antitoxin begins very soon after the inoculation of a favorable amount of toxine.

The antitoxin is a product of the body and appears to be a specific substance of the cells.

The tetanus toxine combines chemically, according to Milchner,[c] 1898, with the antitoxic group of the central nervous system in the test tube, without the help of the living organism. This indicates, according to Ehrlich's theory, that there is also a chemical union between the toxine and the nervous system in the living body.

Marie,[d] 1898, showed that the toxine injected into animals remains a variable time in the blood; this time passed, the inoculation of the organs and glandular secretions is negative. When injected under the skin, a part of the toxine is taken up by the nerve fibers. He also found that the brain of rabbits neutralizes tetanus toxine. The cells of the central ganglions are much less active than those from the cerebral surface.

For the purpose of testing the action of cord and brain of normal animals on tetanus toxine, Wassermann and Takaki,[e] 1898, used a solution of tetanus toxine, containing as a preservative an equal amount of glycerin, and of such strength that 0.001 c. c. was a fatal dose to a mouse weighing 15 grams within three days after inoculation.

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[a] Vaillard and Vincent: Sur. le poison tétanique. La sem. med., vol. 10, 1890, pp. 425–426.

[b] Knorr, A.: Die Entstehung de Tetanusantitoxins im Theirkörper und seine Beziehung zum Tetanusgift. Fortschr. d. Med., vol. 15, 1897, pp. 657–669.

[c] Milchner, Richard: Nachweiss der chemischen Bindung von Tetanusgift durch Nervensubstanz. Berl. klin. Woch., vol. 35, 1898, pp. 369–371.

[d] Marie, A.: Recherches sur les la toxine tétanique. Ann. Inst. Pasteur, vol. 11, 1897, p. 591; vol. 12, 1898, p. 91.

[e] Wassermann, A., and Takaki, T.: Ueber tetanusantitoxische Eigenschaften des normalen Centralnervensystems. Berl. klin. Woch., vol. 35, 1898, pp. 5–6.

They mixed a single, double, triple, ten times fatal dose, etc., of the tetanus toxine with 1 c. c. of emulsion of normal cord or brain in a flask and injected this subcutaneously in the dorsal region. As controls, equal amounts of emulsion of liver, kidney, spleen, marrow, or 1 c. c. serum of same animal were mixed with the specified quantities of toxine and likewise subcutaneously injected into mice, and as a further control the tetanus toxine alone was injected. In all their experiments thus carried out they could, without exception, demonstrate that normal brain or cord always had an antitoxic action, while no other tested organ showed this action.

The antitoxic power of the brain of normal guinea pigs is so decided that 1 c. c. of brain emulsion will neutralize ten times the lethal dose. A definite retarding influence is exerted by the emulsion on a 60-times lethal dose. The cord is definite, though feebler, in its influence; its emulsion will neutralize three times the fatal dose.

They were able to immunize against three and five times the fatal dose by an injection of emulsion of brain twenty-four hours before. They could even save a mouse that had received a fatal dose of toxine by the injection of the emulsion four to six hours after. The tetanus toxine-binding power of the central nervous system acts not only by direct mixing in vitro, but also in the living organism. Their experiments lead them to believe that the fixing power of the central nervous system is due to a property of the cell and not to a water-soluble substance.

Metchnikoff,[a] 1898, agrees with Wassermann and Takaki that the brain and cord of guinea pigs neutralize tetanus toxine. From his own experiments he concludes that the antitetanic action of the nervous centers is a property of mammals. The nervous centers of the fowl are much less efficacious, the tortoise only very feebly so, and the frog not at all.

Roux and Borrel,[b] 1898, find that animals are much more sensitive to intracerebral than to subcutaneous injections of toxine. Animals highly resistant to injections under the skin or in the veins are sensitive to injections into the brain. The nerve cells are still sensitive to the toxine.

Danysz,[c] 1898, showed that:

The cerebral substance of guinea pigs fixes a variable amount of tetanus toxine according to the medium used.

The quantities of toxine fixed by the cerebral substance are much greater when the liquid itself in which the emulsion has been made, exercises the least energetic modify-

[a] Metchnikoff, E.: Sur l'influence de l'organisme sur les toxine. Ann. Inst. Pasteur, vol. 12, 1898, p. 81.

[b] Roux, E., and Borrel, A.: Tétanos cérébral et immunité contre le tétanos. Ann. Inst. Pasteur, vol. 12, 1898, p. 225.

[c] Danysz: Contribution a l'étude de la toxine tétanique. Ann. Inst. Pasteur, vol. 13, 1898, pp. 156-168.

ing action on the toxine. This quantity is the greatest in physiologic salt solution, which best preserves the cerebral substance in its normal state. If the amount fixed by the brain emulsified in normal salt solution be taken as 100, we will have for the others about the following proportions:

If a brain of a guinea pig emulsified in normal salt solution absorbs 100 parts toxine, the same brain emulsified in distilled water will absorb 90 parts toxine; if emulsified in 10 per cent salt solution, will absorb 5 parts toxine; if boiled in distilled water, will absorb 10 parts toxine.

The fixation of the toxine by the cerebral substance is not permanent, as has been previously shown by Metchnikoff. It diffuses in the liquid of maceration, and this diffusion is much more rapid when the liquid exercises a more energetic action upon the nervous substance.

He concluded that the phenomenon of the fixation of the tetanus toxine by nervous tissue, in spite of some analogies, can not be likened to the action of antitoxin on toxine, because the toxine at first fixed by the nervous substance becomes again free *in vitro* and *in vivo*. The neutral mixture of toxine and nervous substance becomes again with time more and more toxic, while, on the contrary, the toxic mixture of toxine and antitoxin become with time less toxic.

Blumenthal and Jakob,[a] 1898, used a method to free a part of the tetanus toxine which has been fixed in the central nervous system. They concluded that the tetanus poison at the time of the outbreak of the symptoms of tetanus is so anchored in the central nervous system that it can not be set free by means of subdural infusions of antitoxin.

Ransom[b] found that the tetanus toxine as well as the antitoxin is taken up from the subcutaneous tissue by means of lymphatic vessels and carried to the blood stream.

After intravenous injection a considerable portion of the toxine as well as the antitoxin is carried over into the lymph. In the cerebro-spinal fluid, on the other hand, the antitoxin appears in comparatively small amounts and the toxine can not be definitely demonstrated. Tetanus antitoxin injected into the subarachnoid space does not cause an increase in the normal, detoxicating power of the nerve substance and most all of it quickly passes over into the blood stream.

After injections of the toxine into the central nervous system the nervous system becomes toxic itself and loses for a time the property of neutralizing the poison. This is not due to adherent cerebro-spinal fluid, but rather to the fact that the nerve substance holds the toxine fast.

The disappearance of tetanus toxine from the blood of chickens after intravenous injections of small quantities does not depend upon

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[a] Blumenthal, Ferdinand, and Jakob: Zur Serumtherapie des Tetanus. Berl. klin. Woch., 1898.

[b] Ransom, F.: Die Vertheilung von Tetanusgift und Tetanusantitoxin in lebenden thierischen Körper. Berl. Klin. Woch, vol. 38, 1901, pp. 337–340; 373–375.

the combination of the unchanged toxine in any one organ. Up to the time when the toxine disappears and the antitoxin begins to appear in the blood no collection of antitoxin can be found in any organ. The intravenous injection of very small quantities of toxine into hens, quantities too small to cause harmful reactions, causes considerable antitoxin to appear.

The above experimental work on the affinity of the nerves for the toxine and the neutralization of the toxine by the nervous tissue led Marie and Morax,[a] 1902, and Meyer and Ransom, 1903, independently to study the method of absorption of the toxine. The paper by Marie and Morax was published in 1902. They find that the absorption of tetanus toxine by the peripheral nerves is in consequence of the specific affinity for the axis cylinder substance. This affinity is not shown in experiments *in vitro*, contrary to those which are observed with the cord or with the brain, but is shown with the greatest ease by experiments *in vivo*. Fixation of the toxine upon the nerves occurs very rapidly. It has the characteristic of not being very stable.

They showed that the toxine once fixed, is displaced centripetally with a relatively feeble rapidity. This axis cylinder circulation has for its effect the transportation of the diluted toxine in the fluids to the ganglionic cells. The authors believe that they are able to formulate the following hypothesis: Injected into a muscle or into a region a little removed from a muscular mass, the toxine distributes itself in the serous fluid which impregnates the tissues, and passes in part to the blood, where it can be found very soon. In the zone of inoculation the serous fluid charged with the toxine is found in contact with expansions of the nerves at their endings. The motor nerves as well as the vaso-motor nerves absorb it and transfer it, so that in a relatively short time the substance of the peripheral nerves contains it in quantity larger than the fluids which bathe the tissues at some distance from the point of absorption. Diffusion of the toxine occurs centripetally. It may be compared to the absorption of nourishing liquids by the roots of a plant. The portion of toxine contained in the lymph at the point of contact remains twenty-four hours or less. This amount is greater than the portion contained in the blood, and consequently in the lymph in different parts of the body. Absorption by the nerve fibers at the region inoculated is then greater during the first twenty-four hours than that which takes place in other regions. The corresponding motor nerves will be, consequently, the first saturated by the toxine, and this saturation will be manifested by a localized contraction or by a local tetanus. However, in other regions the terminations of the nerves will absorb a certain quantity of toxine carried to them by the lymph. It is then that local tetanus will be succeeded

[a] Marie, A., and Morax, V.: Recherches sur l'absorption de la toxine tetanique. Ann. Inst. Pasteur, vol. 18, 1902, p. 818–832.

by general tetanus. We are not yet able to decide whether the tetanus toxine can pass from the peripheral neuron to a sensory neuron with which it is connected, or if the contractions are to be attributed to the action of the toxine upon the one or the other of those cellular elements.

In the absorption of the toxine it is necessary to consider not only the number of absorbing elements, but also the concentration of the solution of the toxine, for this concentration is always much more considerable at the point of inoculation than in other regions, where the toxine only diffuses in the mass of blood. This preponderating absorption by the nerve fibers at the inoculated region explains why the injection at several points of the body of a nonfatal dose of the toxine provokes the appearance of tetanus earlier and more severely than inoculation at a single point. When, instead of injecting the toxine under the skin or into the muscle, it is introduced directly into a viscus, the symptoms of tetanus appear only when the motor nerves are bathed in the toxine circulating in the blood.

In a later paper Marie and Morax[a] found that the central nerve substance of mammals, which possesses the power of neutralizing tetanus toxine, loses its power almost completely by drying in a vacuum. Some brain of a guinea pig finely bruised up is exposed under a vacuum where it loses about three-fourths of its weight. When they endeavored to repeat the experiments of Wassermann with this cerebral powder it was found that the nervous tissue had lost 97 per cent of its fixative power. This fixative power is not influenced by a dry heat of 60°, 100°, or 126° C. It is known, on the other hand, that the drying of antitetanic serum causes slight modification. The phenomenon of Wassermann would not seem, then, to be similar to the antitoxic action of specific sera.

The work of Meyer and Ransom[b] was done about the same time as the work referred to above by Morax and Marie, but not published till July, 1903. They found that the toxine is carried toward the centers by the motor nerves, and that this is the only way for the poison to reach the central nervous system. The toxine absorption by the nerve is dependent upon the integrity of the axis cylinder. A normal nerve retains the toxine for an hour and a half after intramuscular injection, a torn nerve about twenty-four hours; but if the nerve is degenerated it does not absorb the poison till about six hours later. If the nerve be cut before inoculation, there is no toxine in the proximal portion, but it is present in the distal portion. The toxine therefore enters the nerve through the muscle plates and not

[a] Morax, V., and Marie, A.: Note sur les propriétés fixatrices de la substance cérébrale desséchée. Bull de l'Inst. Pasteur, vol. 1, 1903, p. 41.

[b] Meyer, H., and Ransom, Fred.: Untersuchungen über den Tetanus. Arch. f. exper. Path. u. Pharm., vol. 49, 1903.

by the capillaries. After tearing a poisoned nerve the toxine disappears in a few hours in the proximal end, as the rupture stops the upper current. The passage of the toxine upward in the spinal cord is barred by section of the cord. The period of incubation is much shorter when the toxine is injected into the nerve than after subcutaneous or intravenous injections; injections into the cord have a still shorter period of incubation.

Their theory of tetanus is that the toxine is probably absorbed by the axis cylinder endings and reaches the corresponding spinal nerve center by that route; from the spinal center it spreads to the corresponding center in the other half of the cord and outwards, resulting in generalized tetanus. When intoxication is produced through the circulation, the poison is taken up by the nerve ends in all parts of the body and the disease is not localized, but general. The antitoxin, unlike the toxine, does not travel by the nerve route, but is found only in the blood and lymph.

Besredka[a] showed that the cerebral mass is capable of fixing more tetanus toxine than it is capable of neutralizing. The fixative substance of the brain is not then an antitoxic substance in the proper meaning of the word. The cerebral mass saturated with tetanus toxine recovers some of its primative integrity after the addition of true antitoxin, whether this comes from an animal of the same species or of a different species. The combination of the brain and toxine does not represent, then, a stability comparable to that which exists between the toxine and its true antitoxin. The phenomenon observed by Wassermann and Takaki ought then to be attributed to the presence in the cerebral matter of a particular substance other than the true tetanus antitoxin.

Dmitrievsky,[b] 1903, found that the brain of animals in which the immunization has been of only short duration and of which the blood does not possess high antitetanic power does not differ in its antitetanic property from a normal brain. The brain of animals which were immunized for a long time and of which the blood contained a large quantity of antitoxin is able to inactivate a much larger quantity of tetanus toxine than the brain of normal animals. This difference, however, is not considerable, for all the animals injected with the mixture of the poison and of brain from a guinea pig immunized presented some slight tetanic symptoms. The blood of animals of which the immunization has been continued a long time contains always more tetanus antitoxin than their brain.

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[a] Besredka, A.: De la fixation de la toxine tétanique par le cerveau. Ann. Inst. Pasteur, vol. 17, 1903, pp. 138–147.

[b] Dmitrievsky, K.: Recherches sur les propriétés antitétaniques des nerveaux de l'animal immunisé. Ann. Inst. Pasteur, vol. 17, 1903, pp. 148–160.

A second paper by Morax and Marie,[a] appeared in 1903, in which they showed that the affinity of tetanus toxine for the nerves seems to be shown *in vitro* by the experiments of Wassermann and is proved *in vivo* by the presence of this poison in the nerves of tetanized animals. It has been definitely established that it is the peripheral expansions of the neurons which absorb the toxine for transportation from point to point toward the nerve cell.

The object was to determine the respective neurons in this fixation and in this transportation of the toxine. The discovery of the poison in the nerve areas has shown that the three different types of nerve fibers constituting the cord, viz, the motor fibers, sensory, and sympathetic, are equally able to absorb the tetanus toxine. The considerable portion of this poison found in the massateric nerves is in conformity with the early appearance of tetanus in this region. The total absence of tetanus toxine in the optic nerves corroborates the anatomical findings which show them to be a prolongation of the brain, as it is known that the toxine is not found in the medulary neurons or brain, since it is fixed by them.

Blumenthal[b] concludes that:

The cells of the body as well as the central nervous system have the property of binding tetanus toxine.

The tetanus poison is altered in the organism as a consequence of this binding with the cells.

There is an affinity of the antitoxin for the tetanus poison which has been bound in the tissues. This affinity is, however, comparatively slight in comparison to that it has for the toxine secreted by the cultures.

Tiberti,[c] 1905, concludes as follows:

If we inject tetanus toxine subcutaneously into susceptible animals, the largest part first goes into the lymphatic vessels and from there into the blood. A smaller quantity is absorbed by the nerve endings and is carried by them to the nerve centers. After hypodermic injection of tetanus toxine in a limb the toxine-constant in the large nerves of that limb is demonstrable.

The transportation of the tetanus toxine to the nerve centers by the nerve routes takes place not through the lymph channels, but in the plasma of the nerve fiber consisting of the axis cylinder. In order that the nerve fibers may be capable of taking up the tetanus toxine and conducting it to the nerve centers, it is necessary that the axis cylinder be normal.

The tetanus toxine moves toward the nerve cells because the latter have a special affinity for tetanus toxine and in that way the nerve fibers become saturated.

If tetanus toxine is injected into a muscle it diffuses throughout the muscle itself in the serous fluid. It is then taken up by the nerve endings in the muscle and by means of the nerves is carried to the center.

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[a] Morax, V., and Marie, A.: Recherches sur l'absorption de la toxine tétanique. Ann. Inst. Pasteur, vol. 17, no. 5, 1903, pp. 335–342.

[b] Blumenthal, Ferdinand.—Ueber das an die Organe gebundene Tetanusgift und seine Beziehung zum Antitoxin. Arch. f. physiol., 1904, pp. 217–220.

[c] Tiberti: Ueber den Transport des Tetanusgiftes zu den Rückenmarkszentren durch die Nervenfasern. Centblt. f. Bakt., 1 abt, vol. 38, 1905, pp. 281, 413, 499, 625.

Tetanus toxine inoculated into the gluteus muscle of a guinea pig is found in the corresponding ischiatic nerve in evident doses one and a half hours after the injection, whereas it is found much quicker in the blood, viz, after ten minutes.

Minimal doses of tetanus toxine are sufficient to cause severe symptoms of tetanus poisoning if injected into the parenchyma of a nerve. The same doses if injected under the skin or into the circulation produce no tetanic symptoms.

If tetanus antitoxin is injected into a nerve trunk and immediately thereafter tetanus toxine is inoculated into the corresponding muscle enervated by this nerve, it is possible to prevent the toxine reaching the corresponding nerve center and no symptoms of tetanus of any kind appear in the muscle area in question.

Tetanus toxine inoculated directly into the nerve has no other channel of transference to the nerve centers than the nerve substance itself. This fact is demonstrated by severing the spinal cord at a particular point, in which case the effect of the toxine is limited to the area corresponding to the section of the cord connected with the seat of the inoculation. And, further, the section of the spinal cord prevents the spreading of the toxine to the upper regions of the cord.

By cutting a particular nerve trunk the muscles innervated by this nerve show no indication of tetanus following the inoculation of tetanus toxine.

If tetanus antitoxin is injected directly into the substance of the spinal cord, then we see a decided abbreviation of the period of incubation, and such inoculation gives us a characteristic picture of the disease known as tetanus dolorosus.

If tetanus toxine is injected into the circulation, we have, after a longer or shorter period of incubation, dependent upon the animal species, all muscles simultaneously seized with tetanus contractures, because the tetanus toxine is absorbed by all the nerve trunks at the same time and thus conveyed to the nerve centers. In such cases we do not get the so-called local tetanus which is observed when the toxine is injected under the skin or into the parenchyma of the nerve. It requires a much stronger dose of toxine in order to produce symptoms of tetanus in an animal when the toxine is injected directly into the circulation than when it is given subcutaneously or directly into a nerve.

The tetanus toxine injected into the circulating blood quickly passes out into the lymph. The tetanus toxine can not be demonstrated with certainty in the cerebrospinal fluid.

Loew and Meyer[a] say that the characteristic symptoms of tetanus poisoning are to a certain extent due to the effects of the toxine upon the central nervous system. An exception was found by Dönitz in the condition called by him "tetanus sine tetano." He found that in intravenous injections in rabbits of tetanus toxine in quantities insufficient to produce local tetanus the animals nevertheless rapidly lost weight and died. Dönitz believed that the cause of cachexia was a parenchymatous degeneration. Loew and H. Meyer injected a number of rabbits with small quantities of tetanus toxine after the manner of Dönitz and found that some of them died without symptoms of tetanus and that some remained well. The animals that died showed symptoms of coccidial infection, and he therefore concluded that the cachexia was not caused by the tetanus toxine.

Loew and Meyer then conducted some experiments to determine whether animals could be rendered hypersusceptible to tetanus

[a] Loew, O., and Meyer, H.: Zur Kenntniss der Tetanusvergiftung. Sitzungsb. d. Gesellsch. f. Beförd. d. ges. Naturw. zu Marb. (1904), 1905, p. 11–13.

poison in the same sense that Behring and Kitashima showed in guinea pigs treated with small doses of diphtheria toxine. These investigations terminated negatively. The authors succeeded, however, in inducing hypersusceptibility to tetanus toxine in rabbits by the intradural injection of minute amounts.

From the above review it seems to have been definitely shown that the motor nerves have a specific affinity for tetanus toxine. When the toxine is given subcutaneously, the adjacent motor nerve-endings at once begin to take it up and transport it to the cord. The lymphatics also absorb much of it, and in a short while it appears in the blood stream, which carries it to all parts of the body, where it is absorbed by the motor nerve-endings, which are bathed in the toxine-laden fluid. The reason that the symptoms appear earlier in the limbs in which the toxine is injected is because the toxine-index, as it were, is higher there than in other parts of the body. When the toxine is given into the cord or into a nerve trunk, the incubation period is shortened; if into a nerve trunk, the tetanus is sharply localized at first, and in fact the animal may die before general tetanus sets in. When given into the circulation, generalized tetanus results in a short time. The weight of evidence is in favor of the view that the toxine produces its effect solely by the absorption of the toxine by the nerves, whose axis cylinder substance has a specific affinity for the poison. They transport it to the cord and brain through the axis cylinder substance itself.

THE GERMAN METHOD OF STANDARDIZING TETANUS ANTITOXIN.[a]

The official testing of this serum is conducted at the Kgl. Institut für experimentelle Therapie zu Frankfurt a. M., of which Dr. Paul Ehrlich is the director. Tetanus antitoxine, like other curative sera, is examined in the Institut first for harmlessness and second for potency.

The serum is considered harmless if (1) it is wholly clear and free from much precipitate; (2) contains no bacterial contamination; (3) contains not more than 0.5 per cent phenol or 0.4 per cent trikresol; (4) is free from toxines, especially tetanus toxine.

The serum should not contain more than a very slight precipitate at the bottom and must under all circumstances be absolutely clear. The tests of the serum for sterility are made in accordance with the usual bacteriological methods. Five drops of the serum are planted into one agar plate, two glucose-bouillon test tubes, and a glucose-agar test tube with a sufficient quantity of the media for deep anæ-

[a] The account of the German methods of testing is taken from Otto's work entitled "Die Staatliche Prüfung der Heilsera," Jena, 1906. Also from Behring's "Die Wertbestimmung des Tetanus-antitoxins und seine Verwendung in der Menschen-ärztlichen und thierärztlichen Praxis." Deut. med. Woch., vol. 26, 1900, p. 29–52, etc.

robic cultures. The inoculated plates and tubes must remain sterile. In order to test the quantity of phenol contained in the serum, a mouse weighing 15 grams is injected subcutaneously with 0.5 c. c. of the serum. If this mouse shows slight or no symptoms of poisoning, then the serum does not contain an excessive amount of the preservative allowed.

A guinea pig is then injected subcutaneously with 10 c. c. of the serum in order to determine the presence of tetanus. If the guinea pig remains well, it is considered definite proof that the serum is free from this dangerous contamination. For this test it is necessary to use healthy, normal animals that have not been previously used for other purposes, so as to avoid the serum reaction.[a]

The official testing of antitoxin for potency at Ehrlich's institute is based entirely upon von Behring's method.[b] Von Behring proceeds as follows:

He dilutes the serum to be tested with physiological salt solution in the proportion of 1 c. c. of serum to 99 c. c. of the salt solution. One cubic centimeter of this dilution is then placed in an Erlenmeyer flask containing 38 c. c. of distilled water, and 1 c. c. of a high-grade test poison is added (the test poison No. $5 = \frac{N}{10}$). A uniform mixture of these three substances is obtained by shaking and the mixture is then allowed to stand thirty minutes, when a mouse of medium weight is injected subcutaneously with 0.4 c. c. If the mouse receiving 0.4 c. c. of this mixture remains well, then the serum contains at least 10 immunity units in 1 c. c., because 1 c. c. of the dilution 1:100 was entirely neutralized with 1 c. c. of the toxine, representing 0.1 normal poison. If the mouse after the subcutaneous inoculation of 0.4 c. c. of the mixture becomes tetanic, then the serum naturally contains somewhat less than 10 immunity units. If the mouse dies, we may form some judgment from the time intervening between the injection and death as to the approximate value of the serum.

[a] Otto, R.: Das Theobald Smithsche Phänomen der Serum-Ueberempfindlichkeit. Leuthold-Gedenkschrift, Bd. 1.

Rosenau, M. J., and Anderson, John F.: A study of the cause of sudden death following the injection of horse serum. Bull. No. 29, Hyg. Lab., U. S. Pub. Health and Mar.-Hosp. Serv., Wash., 1906.

Rosenau, M. J., and Anderson, John F.: Studies upon hypersusceptibility and immunity. Bull. No. 36, Hyg. Lab., U. S. Pub. Health and Mar.-Hosp. Serv., Wash., 1907.

[b] Behring and Knorr: Ueber den Immunisierungswert und Heilwert des Tetanusheilserums bei weissen Mäusen. Zeit. f. Hyg., vol. 13, 1893.

v. Behring: Allg. Therapie der Infektionskrankheiten. Berlin and Vienna, Urban & Schwarzenberg, 1899.

——: Die Wertbestimmung des Tetanusantitoxins und seine Verwendung in der menschenärztlichen und tierärztlichen Praxis. Deut. med. Woch., 1900, No. 2.

More precise determination of the potency of serums injected into mice which remain entirely well after the injection of 0.4 c. c. of the mixture is made by further experiments. If in this way we obtain the L° value of the serum, we are enabled by a simple process of calculation to determine the antitoxic worth of the serum. That quantity of serum in 0.4 c. c. of the mixture containing 0.01 c. c. of test poison No. 5 (= L° dose) contains exactly $\frac{1}{100}$ of an immunity unit.

Behring's notations, generally used in the German literature, are as follows:

1+Ms represents the fatal dose for 1 gram of mouse.
1+M represents the fatal dose for 1 gram of guinea pig.
Ms^{15} represents 15 times the minimal lethal dose for 1 gram of mouse.
The toxine is always represented by the plus sign, the antitoxin by the minus sign.

The present modification of the methods for testing tetanus antitoxin at Ehrlich's institute are largely based upon the work of Marx,[a] who found that the tetanus toxine could be preserved in a stable condition in a dried state in Ehrlich vacuum tubes.

The official testing of antitoxin is carried out in the following manner: One of the vacuum tubes containing the poison and another containing the serum are carefully opened by means of a file, and a certain quantity of water, say 5 c. c., added to each tube from a graduated pipette. The tubes are then carefully closed with a burnt cork. Each tube—the one containing toxine and the other serum—is now shaken many times in order to insure the complete solution of its contents. The contents of each tube are next emptied and carefully washed out with the remaining quantity of the diluting fluid. The serum must be so diluted that 1 c. c. of the solution represents just 0.01 of an immunity unit. After this has been accomplished the mixture of the toxine and antitoxin *in vitro* is made. For this purpose two series of eight flasks each are necessary. One c. c. of the standard serum solution is placed in each flask of the first series; 1 c. c. of a dilution of the unknown serum to be tested is placed in each flask of the second series. To each series is now added the following test doses of toxine, varying in accordance with the toxine from 0.8 to 1.5 c. c. These doses are so calculated that all the values from L°

[a] Marx, E.: Mitteilungen aus der prüfungstechnischen Praxis. Festschrift f. Robert Koch. Jena, Gustav Fischer, 1903.

———: Diagnostik, Serumtherapie und Prophylaxe. Bibliothek v. Coler, vol. 11, Berlin, 1902.

Dönitz, W.: Die Wertbemessung der Schutz- und Heilsera. Handbuch Kolle-Wassermann, vol. 4, part 2.

to L+ will be found in the series. Water is now added to the toxine-antitoxin mixtures, so that each flask will contain a total of 4 c. c. These flasks are well corked and remain one-half hour at room temperature protected from daylight by means of lead shells. After this period white mice are inoculated. Corresponding to the mixtures made, two series of eight mice each are injected. Each mouse receives 0.4 c. c. of the particular mixture under the skin of the right hind foot. Each mouse, therefore, receives $\frac{1}{100}$ of an immunity unit plus varying amounts of toxine. As the doses of the toxine are selected so that each series of eight mice will give all values from the L° to the L+ limits, it is possible to determine from such a series all phases, as some animals will remain normal, others show symptoms of tetanus, and others die acutely.

If the unknown serum which is being tested has just the strength supposed for it in accordance with the above test, then the results in the two series of animals correspond precisely. If, however, it is weaker, there is a considerable difference in the results; from which it is easy to see about how much weaker the serum is than the standard serum. The following tables gives an example of tests made in accordance with the above explanation:

THE STATE TESTING OF THERAPEUTIC SERA.

Date: February 1, 1905.
Tetanus antitoxin: Manufacturer, X; No. y.
Sent in: January 31, 1905. Received: February 1, 1905.
Horses Nos. 4 and 6: Bled September 22 and 24, 1904. Quantity of serum sent in: 5 liters. Phenol content: 0.5 per cent. Strength claimed: 6 × normal.
Test for sterility: Sterile.
Test for phenol content: Mouse showed slight trembling.
Potency determination: 6 immunity units.
I. Standard serum: Dilution, 0.006 to 26 c. c.
II. Serum: X No. 11. Dilution, 1:600 (=1+19, 1+29, etc.).
III. Normal poison solution: To 1 c. c. of the diluted serum is added:

Poison.	Water.
0.8 c. c.	2.2 c. c.=4 c. c.
0.9 c. c.	2.1 c. c.=4 c.c.
1.0 c. c.	2.0 c. c.=4 c. c.
1.1 c. c.	1.9 c. c.=4 c. c.
1.2 c. c.	1.8 c. c.=4 c. c.
1.3 c. c.	1.7 c. c.=4 c. c.
1.4 c. c.	1.6 c. c.=4 c. c.
1.5 c. c.	1.5 c. c.=4 c. c.

The mixture of toxine and serum is allowed to stand half an hour at room temperature.
Quantity injected: 0.4 c. c.
Kind of animal: White mice (15 grams).

Kind of serum and date of test.	Result.
Standard serum.	
Mouse 1; poison, 0.8 c. c.; yellow head:	
February 2, 1905	0
February 3, 1905	0
February 4, 1905	0
February 5, 1905	0
February 6, 1905	0
February 7, 1905	0
Mouse 2; poison, 0.9 c. c.; yellow neck:	
February 2, 1905	0
February 3, 1905	0
February 4, 1905	0(?)
February 5, 1905	?
February 6, 1905	?
February 7, 1905	?
Mouse 3; poison, 1.0 c. c.; yellow back:	
February 2, 1905	?
February 3, 1905	Slight symptoms.
February 4, 1905	Do.
February 5, 1905	Mild symptoms.
February 6, 1905	Do.
February 7, 1905	Marked symptoms.
Mouse 4; poison, 1.1 c. c.; yellow rump:	
February 2, 1905	Slight symptoms.
February 3, 1905	Mild symptoms.
February 4, 1905	Marked symptoms.
February 5, 1905	Do.
February 6, 1905	Do.
February 7, 1905	Very marked symptoms.
Mouse 5; poison, 1.2 c. c.; yellow right front foot:	
February 2, 1905	Mild symptoms.
February 3, 1905	Marked symptoms.
February 4, 1905	Very marked symptoms.
February 5, 1905	Marked symptoms.
February 6, 1905	Very severe symptoms.
February 7, 1905	Severe symptoms.
Mouse 6; poison, 1.3 c. c.; yellow left front foot:	
February 2, 1905	Mild symptoms.
February 3, 1905	Very marked symptoms.
February 4, 1905	Marked symptoms.
February 5, 1905	Very severe symptoms.
February 6, 1905	Severe symptoms.
February 7, 1905	Violent tetanus.

Kind of serum and date of test.	Result.
Serum No. y.	
Mouse 9; poison, 0.8 c. c.; red head:	
February 2, 1905	0
February 3, 1905	0
February 4, 1905	0
February 5, 1905	0
February 6, 1905	0
February 7, 1905	0
Mouse 10; poison, 0.9 c. c.; red neck:	
February 2, 1905	0
February 3, 1905	0
February 4, 1905	0(?)
February 5, 1905	?
February 6, 1905	?
February 7, 1905	?
Mouse 11; poison, 1.0 c. c.; red back:	
February 2, 1905	?
February 3, 1905	Slight symptoms.
February 4, 1905	Do.
February 5, 1905	Mild symptoms.
February 6, 1905	Do.
February 7, 1905	Marked symptoms.
Mouse 12; poison, 1.1 c. c.; red rump:	
February 2, 1905	Slight symptoms.
February 3, 1905	Mild symptoms.
February 4, 1905	Marked symptoms.
February 5, 1905	Do.
February 6, 1905	Do.
February 7, 1905	Very marked symptoms.
Mouse 13; poison, 1.2 c. c.; red right front foot:	
February 2, 1905	Mild symptoms.
February 3, 1905	Marked symptoms.
February 4, 1905	Very marked symptoms.
February 5, 1905	Marked symptoms.
February 6, 1905	Very severe symptoms.
February 7, 1905	Severe symptoms.
Mouse 14; poison, 1.3 c. c.; red left front foot:	
February 2, 1905	Mild symptoms.
February 3, 1905	Very marked symptoms.
February 4, 1905	Marked symptoms.
February 5, 1905	Very severe symptoms.
February 6, 1905	Severe symptoms.
February 7, 1905	Violent tetanus.

Kind of serum and date of test.	Result.	Kind of serum and date of test.	Result.
Standard serum—Cont'd.		*Serum No. y*—Cont'd.	
Mouse 7; poison, 1.4 c. c.; yellow right hind foot:		Mouse 15; poison, 1.4 c. c.; red right hind foot:	
February 2, 1905.....	Marked symptoms.	February 2, 1905.....	Marked symptoms.
February 3, 1905.....	Very severe symptoms.	February 3, 1905.....	Very severe symptoms.
February 4, 1905.....	Tetany.	February 4, 1905.....	Tetany.
February 5, 1905.....	Dead, 4.	February 5, 1905.....	Dead, 4.
Mouse 8; poison, 1.5 c. c.; yellow left hind foot:		Mouse 16; poison, 1.5 c. c.; red left hind foot:	
February 2, 1905.....	Very severe symptoms.	February 2, 1905.....	Very severe symptoms.
February 3, 1905.....	Tetanus.	February 3, 1905.....	Tetanus.
February 4, 1905.....	Dead, 3.	February 4, 1905.....	Dead, 3.

In the above illustrated case the two series of animals reacted precisely the same. It therefore shows that the antitoxin tested was in reality six times the normal strength.

It is evident, however, that the standardization of tetanus antitoxin by the German method is much more complicated than the testing of diphtheria antitoxin.[a]

The following preparations of tetanus antitoxin are found upon the German market (1904):

1. V. Behring's tetanus curative serum, made by Professor v. Behring, officially tested by Professor Ehrlich at the Frankfurt Institut for experimentelle Therapie. It is sold by the Marbourg firm of Doctor Siebert and Doctor Ziegenbein. The preparation is sold in two amounts, the one containing 100 immunity units (the curative dose) and the other 20 immunity units (for prophylactic use). Small vials of dried antitoxin, containing 20 immunity units, for dusting wounds, are also sold.

2. Tizzoni's tetanus serum, made by Tizzoni and Cattani. This is sold by the firm of Merck, in Darmstadt. The preparation is sold in original vials of 5 grams each (normal dose) = 5,000,000 immunity units.

THE ITALIAN METHOD OF STANDARDIZING TETANUS ANTITOXIN.

The Tizzoni preparation is now sold by Merck, at Darmstadt, and is said to contain in every cubic centimeter 80,000 immunity units (I. U.); in other words, the antitoxin amount which will neutralize 80,000 toxine units. The toxine unit, according to this reckoning, is that amount of toxine which will kill a rabbit weighing 1 kilogram in from four to five days. The dried antitoxin is usually furnished, 0.1 of a gram of which represents 1 c. c. of serum.

[a] V. Lingelsheim: Immunität bei Tetanus. Kolle & Wassermann's Handbuch, vol. 4, part 2.

The Italian method is based entirely upon the work and theoretic considerations of Prof. Guido Tizzoni [a] and Giuseppina Cattani.

Tizzoni early abandoned the methods of standardizing tetanus antitoxin by injecting the serum and the poison separately into the animal with an interval of twenty-four hours. He soon found that the method of Ehrlich, Kossel, and Wassermann, which consists of injections of mixtures *in vitro* of toxine and antitoxin (of diphtheria), gives more accurate and reliable results. In applying this method to tetanus, Tizzoni encountered certain difficulties, due more particularly to the unstable nature of the tetanus toxine. He correctly observes that "Nothing more embarrassing can be imagined than experimenting with a toxine which changes in the hands of the experimenter and the precise grade of the potency of which can not be known at a given moment. Researches pursued under these conditions are long, laborious, often contradictory, uncertain, and confused; the conclusions derived from them are rather deductions than demonstrations; it is impossible to institute a continuous series of experiments, and the few certain results obtained are arrived at almost by accident in the midst of a farrago of observations which are of no service on account of the defects, in greater or less degree, in the dose of toxine used." A stable toxine from tetanus cultures can not be obtained. Cultures reach their maximum toxicity from the seventh to the fifteenth day and then gradually weaken, even when kept cold and protected from light. Filtration weakens the poison. Tizzoni found that filtrates even when kept under oil, in vacuo, or under gases lose their toxic value.

Tizzoni and Kitasato independently found that if filtered cultures are reduced to dryness in vacuo at a low temperature (20°–22° C.) the resulting yellow-brown scales gradually lose toxicity. No better success was had with Brieger and Frankel's method of precipitation with alcohol. It seems that Tizzoni was the first to obtain a precipitated tetanus toxine with ammonium sulphate, following the method of Brieger and Frankel with other toxines. Buchner and Rapp used the same method and obtained a stable poison. But Tizzoni found these precipitates not to be constant. He believes that these precipitates first decompose rapidly and then very slowly, so that they contain a large quantity of transformed toxine, capable of confusing the results of experiments.

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[a] The information in regard to the Italian method of standardizing tetanus antitoxin was gotten from "Sul Modo di Determinare la Potenza del Sero Antitetanico, col metodo della mescolanza in vitro" by Prof. Guido Tizzoni, in "Memorie della r. Accademia delle Scienze dell' Instituto di Bologna," Tomo 8, Serie Quinta, Bologna, 1899-1900. Professor Tizzoni's entire article was kindly translated for us by Miss E. R. Jones.

Tizzoni believes that the weakening of the dried precipitated toxin is due to the production of an acid substance. It was for this reason that Knorr dissolved the precipitate in a 10 per cent solution of sodium chloride.

Tizzoni at one time believed the instability of the precipitated toxine to be due to the ammonium sulphate which remained in the precipitate and eliminated this by spreading the fresh moist precipitate upon porous porcelain; but the toxine so obtained showed itself to be no more stable than those that preceded it. On the other hand, he obtained very satisfactory results by the elimination of the sulphate of ammonium by means of dialysis. Tizzoni claims that tetanus toxine does not dialyze. He recognizes that the stability of the toxine so prepared is not indefinite, for he states that this dialyzed precipitate passes through some modification in the course of time. The toxine, however, is sufficiently stable for the purpose of standardizing antitoxin and for scientific tests. Besides serving for the preparation of the standard antitoxin, this method is applicable for concentrating the poison for injection into animals. Tizzoni showed further that almost all of the toxines produced by a culture are precipitated by ammonium sulphate—that is, there is very little loss in this process.

Tizzoni found that antitoxic serums measured against fresh tetanus toxine and an old and weakened poison gave different results. He believes that this is due largely to the modified toxine or "toxoid" contained in the weakened serum.

Tizzoni considers it of importance to use for the preparation of the toxine, cultures which at the period of their greatest development contain the greatest degree of toxicity. Thus 0.001 c. c. of the filtrate should constantly kill 1 kilogram of rabbit in four days. Cultures which at the moment of precipitation with sulphate of ammonium do not possess this toxicity are rejected.

In view of the differences shown by different species of animals Tizzoni always uses the rabbit for standardizing both toxine and antitoxin, and finds it necessary to take into account the weight of the animal. He concluded that the principal condition to be realized in the standardizing of tetanus antitoxin is the possession of a stable toxine. He dwells upon the importance of determining the therapeutic value of the serums in relation to the antitoxic value as determined by animal tests. Too much confusion prevails to-day in the method of representing the value of tetanus antitoxic serums. This condition should be terminated by adopting a language common to all and easily understood. In the present state of affairs the confusion has arrived at such a point that anyone concerned in a discussion can not judge from the value attributed to two serums of

different origin the real relation of their potencies. Tizzoni therefore pleads for a simplification and unification of methods, and commends his own for general use. Tizzoni prepares two solutions—one of toxine and one of serum—the first in distilled water and the second in 0.75 per cent salt solution. The two solutions are mixed, and after one-half hour of contact the entire mixture is injected into the posterior part of the thigh of a rabbit weighing about 1 kilogram. The value of the serum is always calculated upon the titre of the mixture which does not cause symptoms in an animal.

THE FRENCH METHOD OF STANDARDIZING TETANUS ANTITOXIN.

The strength of the tetanus antitoxin manufactured by the Pasteur Institute is not stated upon the packages sold by the Pasteur Vaccine Company. The prophylactic dose is given as 10 c. c. It is stated that the antitoxic dose of the serum amounts to 1,000,000,000; that is, to protect a mouse against the smallest fatal dose it is sufficient to use $\frac{1}{1,000,000,000}$ of its weight of serum.

The description of the method used in France was kindly sent to us in a personal communication by Professor Arloing, of the Bacteriological Institute of Lyons, having been prepared for him by Professor Courmont, who has charge of the control of antitetanic serum in that institute.

A number of guinea pigs are injected under the skin with quantities of serum equal to $\frac{1}{500,000}$, $\frac{1}{1,000,000}$, $\frac{1}{10,000,000}$, $\frac{1}{10,000,000}$, and even $\frac{1}{1,000,000,000}$ of their weight. Twelve to twenty hours afterwards they, as well as the controls, are inoculated subcutaneously with a single fatal dose of tetanus toxine. The time of death of those which develop tetanus is noted. The serum is then said to have an immunizing or antitoxic power of $\frac{1}{500,000}$, $\frac{1}{1,000,000}$, etc., according as the guinea pig which received $\frac{1}{500,000}$, $\frac{1}{1,000,000}$, etc., of its weight of serum has survived the injection of tetanus toxine fatal for the control.

Professor Courmont adds that their serum is usually of a strength of $\frac{1}{1,000,000}$ and never goes below $\frac{1}{500,000}$.

The French antitoxic serums are made at the Institut Pasteur, Paris, and l'Institut Bacteriologique, Lyon.

TABLES FOR DILUTING THE TOXINE AND ANTITOXIN.

The following tables are used for diluting the tetanus toxines and antitoxins in this laboratory. They are published not only because they will save time and the possibility of error incident to such calculations, but because it is of some importance that the same methods of dilution be used by different laboratories in order that the results

may be strictly comparable. This apparently trifling matter is of some importance in tetanus work on account of the known influence of concentration upon the tetanus poison and its antibody.

TABLE No. 8.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+ 9=1:1000 1 c. c.=0.001

0.7 c. c. of B=0.0007 or 1/1,430	2.2 c. c. of B=0.0022 or 1/454
.8 c. c. of B= .0008 or 1/1,250	2.3 c. c. of B= .0023 or 1/435
.9 c. c. of B= .0009 or 1/1,111	2.4 c. c. of B= .0024 or 1/417
1.0 c. c. of B= .0010 or 1/1,000	2.5 c. c. of B= .0025 or 1/400
1.1 c. c. of B= .0011 or 1/ 909	2.6 c. c. of B= .0026 or 1/384
1.2 c. c. of B= .0012 or 1/ 833	2.7 c. c. of B= .0027 or 1/370
1.3 c. c. of B= .0013 or 1/ 769	2.8 c. c. of B= .0028 or 1/357
1.4 c. c. of B= .0014 or 1/ 714	2.9 c. c. of B= .0029 or 1/345
1.5 c. c. of B= .0015 or 1/ 666	3.0 c. c. of B= .0030 or 1/333
1.6 c. c. of B= .0016 or 1/ 625	3.1 c. c. of B= .0031 or 1/322
1.7 c. c. of B= .0017 or 1/ 588	3.2 c. c. of B= .0032 or 1/312
1.8 c. c. of B= .0018 or 1/ 555	3.3 c. c. of B= .0033 or 1/303
1.9 c. c. of B= .0019 or 1/ 526	3.4 c. c. of B= .0034 or 1/294
2.0 c. c. of B= .0020 or 1/ 500	3.5 c. c. of B= .0035 or 1/285
2.1 c. c. of B= .0021 or 1/ 476	

TABLE No. 9.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+19=1:2000 1 c. c.=0.0005

0.7 c. c. of B=0.00035 or 1/2,860	2.2 c. c. of B=0.00110 or 1/909
.8 c. c. of B= .00040 or 1/2,500	2.3 c. c. of B= .00115 or 1/869
.9 c. c. of B= .00045 or 1/2,222	2.4 c. c. of B= .00120 or 1/833
1.0 c. c. of B= .00050 or 1/2,000	2.5 c. c. of B= .00125 or 1/800
1.1 c. c. of B= .00055 or 1/1,818	2.6 c. c. of B= .00130 or 1/769
1.2 c. c. of B= .00060 or 1/1,666	2.7 c. c. of B= .00135 or 1/741
1.3 c. c. of B= .00065 or 1/1,538	2.8 c. c. of B= .00140 or 1/714
1.4 c. c. of B= .00070 or 1/1,428	2.9 c. c. of B= .00145 or 1/689
1.5 c. c. of B= .00075 or 1/1,333	3.0 c. c. of B= .00150 or 1/666
1.6 c. c. of B= .00080 or 1/1,250	3.1 c. c. of B= .00155 or 1/645
1.7 c. c. of B= .00085 or 1/1,174	3.2 c. c. of B= .00160 or 1/625
1.8 c. c. of B= .00090 or 1/1,111	3.3 c. c. of B= .00165 or 1/606
1.9 c. c. of B= .00095 or 1/1,057	3.4 c. c. of B— .00170 or 1/588
2.0 c. c. of B= .00100 or 1/1,000	3.5 c. c. of B= .00175 or 1/571
2.1 c. c. of B= .00105 or 1/ 952	

TABLE No. 10.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+29=1: 3000 1 c. c.=0.00033

0.7 c. c. of B=0.00024 or 1/4, 170	2.2 c. c. of B=0.00073 or 1/1, 369
.8 c. c. of B= .00027 or 1/3, 700	2.3 c. c. of B= .00076 or 1/1, 304
.9 c. c. of B= .00030 or 1/3, 333	2.4 c. c. of B= .00080 or 1/1, 250
1.0 c. c. of B= .000333333 or 1/3, 000	2.5 c. c. of B= .00083 or 1/1, 200
1.1 c. c. of B= .00036 or 1/2, 777	2.6 c. c. of B= .00086 or 1/1, 154
1.2 c. c. of B= .00040 or 1/2, 500	2.7 c. c. of B= .00090 or 1/1, 111
1.3 c. c. of B= .00043 or 1/2, 302	2.8 c. c. of B= .00093 or 1/1, 071
1.4 c. c. of B= .00046 or 1/2, 173	2.9 c. c. of B= .00096 or 1/1, 034
1.5 c. c. of B= .00050 or 1/2, 000	3.0 c. c. of B= .00100 or 1/1, 000
1.6 c. c. of B= .00053 or 1/1, 850	3.1 c. c. of B= .00103 or 1/ 967
1.7 c. c. of B= .00056 or 1/1, 786	3.2 c. c. of B= .00107 or 1/ 937
1.8 c. c. of B= .00060 or 1/1, 666	3.3 c. c. of B= .00110 or 1/ 909
1.9 c. c. of B= .00063 or 1/1, 587	3.4 c. c. of B= .00113 or 1/ 882
2.0 c. c. of B= .00066 or 1/1, 515	3.5 c. c. of B= .00116 or 1/ 857
2.1 c. c. of B= .00070 or 1/1, 428	

TABLE No. 11.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+39=1:4000 1 c. c.=0.00025

0.7 c. c. of B=0.000175 or 1/5, 714	2.2 c. c. of B=0.000550 or 1/1, 818
.8 c. c. of B= .000200 or 1/5, 000	2.3 c. c. of B= .000575 or 1/1, 739
.9 c. c. of B= .000225 or 1/4, 444	2.4 c. c. of B= .000600 or 1/1, 666
1.0 c. c. of B= .000250 or 1/4, 000	2.5 c. c. of B= .000625 or 1/1, 600
1.1 c. c. of B= .000275 or 1/3, 636	2.6 c. c. of B= .000650 or 1/1, 538
1.2 c. c. of B= .000300 or 1/3, 333	2.7 c. c. of B= .000675 or 1/1, 481
1.3 c. c. of B= .000325 or 1/3, 077	2.8 c. c. of B= .000700 or 1/1, 428
1.4 c. c. of B= .000350 or 1/2, 860	2.9 c. c. of B= .000725 or 1/1, 379
1.5 c. c. of B= .000375 or 1/2, 666	3.0 c. c. of B= .000750 or 1/1, 333
1.6 c. c. of B= .000400 or 1/2, 500	3.1 c. c. of B= .000775 or 1/1, 290
1.7 c. c. of B= .000425 or 1/2, 353	3.2 c. c. of B= .000800 or 1/1, 250
1.8 c. c. of B= .000450 or 1/2, 222	3.3 c. c. of B= .000825 or 1/1, 212
1.9 c. c. of B= .000475 or 1/2, 105	3.4 c. c. of B= .000850 or 1/1, 174
2.0 c. c. of B= .000500 or 1/2, 000	3.5 c. c. of B= .000875 or 1/1, 143
2.1 c. c. of B= .000525 or 1/1, 905	

TABLE No. 12.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A) +49=1:5000 1 c. c.=0.0002

0.7 c. c. of B= .00014 or 1/7,143
.8 c. c. [illegible] .00016 or 1/6,250
.9 c. c. [illegible] .00018 or 1/5,555
1.0 c. c. of [illegible] .00020 or 1/5,000
1.1 c. c. of [illegible] .00022 or 1/4,545
1.2 c. c. of [illegible] .00024 or 1/4,170
1.3 c. c. [illegible] .00026 or 1/3,846
1.4 c. c. [illegible] B= .00028 or 1/3,571
1.5 c. c. of [illegible] .00030 or 1/3,333
1.6 c. c. of [illegible] .00032 or 1/3,125
1.7 [illegible] .00034 or 1/2,941
[illegible] 77
[illegible] 7[illegible]
2.0 c. [illegible] /2,5
2.1 c. c. of B= .[illegible],381
2.2 c. c. of B=0.00044 or 1/2,272
2.3 c. c. of B= .00046 or 1/2,173
2.4 c. c. of B= .00048 or 1/2,083
2.5 c. c. of B= .00050 or 1/2,000
2.6 c. c. of B= .00052 or 1/1,923
2.7 c. c. of B= .00054 or 1/1,851
2.8 c. c. of B= .00056 or 1/1,786
2.9 c. c. of B= .00058 or 1/1,724
3.0 c. c. of B= .00060 or 1/1,666
3.1 c. c. of B= .00062 or 1/1,613
3.2 c. c. of B= .00064 or 1/1,562
3.3 c. c. of B= .00066 or 1/1,515
3.4 c. c. of B= .00068 or 1/1,470
3.5 c. c. of B= .00070 or 1/1,428

TABLE No. 13.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A) +59=1:6000 1 c.c.=0.00017

[illegible] .0117 or 1/8,571
.0133 or 1/7,500
.0150 or 1/6,666
.0166666 or 1/6,000
[illegible] B= .000183 or 1/5,454
1.2 c. c. of B= .000199 or 1/5,000
1.3 c. c. of B= .000216 or 1/4,615
1.4 c. c. of B= .000233 or 1/4,285
1.5 c. c. of B= .000249 or 1/4,000
1.6 c. c. of B= .000266 or 1/3,750
1.7 c. c. of B= .000283 or 1/3,529
1.8 c. c. of B= .000300 or 1/3,333
1.9 c. c. of B= .000317 or 1/3,158
2.0 c. c. of B= .000333 or 1/3,000
2.1 c. c. of B= .000350 or 1/2,857
2.2 c. c. of B=0.000367 or 1/2,727
2.3 c. c. of B= .000383 or 1/2,609
2.4 c. c. of B= .000400 or 1/2,500
2.5 c. c. of B= .000417 or 1/2,400
2.6 c. c. of B= .000433 or 1/2,307
2.7 c. c. of B= .00045 or 1/2,222
2.8 c. c. of B= .000467 or 1/2,143
2.9 c. c. of B= .000483 or 1/2,069
3.0 c. c. of B= .000500 or 1/2,000
3.1 c. c. of B= .000517 or 1/1,938
3.2 c. c. of B= .000533 or 1/1,875
3.3 c. c. of B= .000550 or 1/1,818
3.4 c. c. of B= .000567 or 1/1,764
3.5 c. c. of B= .000583 or 1/1,714

TABLE No. 14.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+69=1:7000 1 c. c.=0.000142857

0.7 c. c. of B=0.	000100	or 1/10, 000	
.8 c. c. of B=	.000114	or 1/8, 750	
.9 c. c. of B=	.000129	or 1/7, 777	
1.0 c. c. of B=	.000142857	or 1/7, 000	
1.1 c. c. of B=	.000157	or 1/6, 363	
1.2 c. c. of B=	.000171	or 1/5, 833	
1.3 c. c. of B=	.000185	or 1/5, 385	
1.4 c. c. of B=	.000200	or 1/5, 000	
1.5 c. c. of B=	.000214	or 1/4, 666	
1.6 c. c. of B=	.000229	or 1/4, 375	
1.7 c. c. of B=	.000243	or 1/4, 118	
1.8 c. c. of B=	.000257	or 1/3, 888	
1.9 c. c. of B=	.000271	or 1/3, 684	
2.0 c. c. of B=	.000285	or 1/3, 500	
2.1 c. c. of B=	.000300	or 1/3, 333	
2.2 c. c. of B=0.	000314	or 1/3, 181	
2.3 c. c. of B=	.000329	or 1/3, 043	
2.4 c. c. of B=	.000343	or 1/2, 916	
2.5 c. c. of B=	.000357	or 1/2, 800	
2.6 c. c. of B=	.000371	or 1/2, 692	
2.7 c. c. of B=	.000385	or 1/2, 592	
2.8 c. c. of B=	.000400	or 1/2, 500	
2.9 c. c. of B=	.000414	or 1/2, 414	
3.0 c. c. of B=	.000429	or 1/2, 333	
3.1 c. c. of B=	.000443	or 1/2, 258	
3.2 c. c. of B=	.000457	or 1/2, 187	
3.3 c. c. of B=	.000471	or 1/2, 121	
3.4 c. c. of B=	.000485	or 1/2, 059	
3.5 c. c. of B=	.000500	or 1/2, 000	

TABLE No. 15.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+79=1:8000 1 c. c.=0.000125

0.7 c. c. of B=0.	0000875	or 1/11, 428	
.8 c. c. of B=	.0001000	or 1/10, 000	
.9 c. c. of B=	.0001125	or 1/8, 888	
1.0 c. c. of B=	.0001250	or 1/8, 000	
1.1 c. c. of B=	.0001375	or 1/7, 272	
1.2 c. c. of B=	.0001500	or 1/6, 666	
1.3 c. c. of B=	.0001625	or 1/6, 154	
1.4 c. c. of B=	.0001750	or 1/5, 714	
1.5 c. c. of B=	.0001875	or 1/5, 333	
1.6 c. c. of B=	.0002000	or 1/5, 000	
1.7 c. c. of B=	.0002125	or 1/4, 706	
1.8 c. c. of B=	.0002250	or 1/4, 444	
1.9 c. c. of B=	.0002375	or 1/4, 210	
2.0 c. c. of B=	.0002500	or 1/4, 000	
2.1 c. c. of B=	.0002625	or 1/3, 809	
2.2 c. c. of B=0.	0002750	or 1/3, 636	
2.3 c. c. of B=	.0002875	or 1/3, 478	
2.4 c. c. of B=	.0003000	or 1/3, 333	
2.5 c. c. of B=	.0003125	or 1/3, 200	
2.6 c. c. of B=	.0003250	or 1/3, 077	
2.7 c. c. of B=	.0003375	or 1/2, 962	
2.8 c. c. of B=	.0003500	or 1/2, 860	
2.9 c. c. of B=	.0003625	or 1/2, 758	
3.0 c. c. of B=	.0003750	or 1/2, 666	
3.1 c. c. of B=	.0003875	or 1/2, 581	
3.2 c. c. of B=	.0004000	or 1/2, 500	
3.3 c. c. of B=	.0004125	or 1/2, 424	
3.4 c. c. of B=	.0004250	or 1/2, 353	
3.5 c. c. of B=	.0004375	or 1/2, 286	

TABLE NO. 16.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+89=1:9,000 1 c. c.=0.000111

0.7 c. c. of B=0.000077 or 1/12, 859	2.2 c. c. of B=0.000244 or 1/4, 091
.8 c. c. of B= .000088 or 1/11, 250	2.3 c. c. of B= .000255 or 1/3, 913
.9 c. c. of B= .000100 or 1/10, 000	2.4 c. c. of B= .000266 or 1/3, 750
1.0 c. c. of B= .000111111 or 1/ 9, 000	2.5 c. c. of B= .000277 or 1/3, 600
1.1 c. c. of B= .000122 or 1/ 8, 173	2.6 c. c. of B= .000288 or 1/3, 461
1.2 c. c. of B= .000133 or 1/ 7, 500	2.7 c. c. of B= .000300 or 1/3, 333
1.3 c. c. of B= .000144 or 1/ 6, 923	2.8 c. c. of B= .000311 or 1/3, 214
1.4 c. c. of B= .000155 or 1/ 6, 428	2.9 c. c. of B= .000322 or 1/3, 103
1.5 c. c. of B= .000166 or 1/ 6, 000	3.0 c. c. of B= .000333 or 1/3, 000
1.6 c. c. of B= .000177 or 1/ 5, 625	3.1 c. c. of B= .000344 or 1/2, 903
1.7 c. c. of B= .000188 or 1/ 5, 293	3.2 c. c. of B= .000355 or 1/2, 812
1.8 c. c. of B= .000200 or 1/ 5, 000	3.3 c. c. of B= .000366 or 1/2, 727
1.9 c. c. of B= .000211 or 1/ 4, 736	3.4 c. c. of B= .000377 or 1/2, 647
2.0 c. c. of B= .000222 or 1/ 4, 500	3.5 c. c. of B= .000388 or 1/2, 571
2.1 c. c. of B= .000233 or 1/ 4, 286	

TABLE NO. 17.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+99=1:10, 000 1 c. c.=0.0001

0.7 c. c. of B=0.00007 or 1/14, 285	1.9 c. c. of B=0.00019 or 1/5, 263
.8 c. c. of B= .00008 or 1/12, 500	2.0 c. c. of B= .00020 or 1/5, 000
.9 c. c. of B= .00009 or 1/11, 111	2.1 c. c. of B= .00021 or 1/4, 762
1.0 c. c. of B= .00010 or 1/10, 000	2.2 c. c. of B= .00022 or 1/4, 545
1.1 c. c. of B= .00011 or 1/ 9, 090	2.3 c. c. of B= .00023 or 1/4, 348
1.2 c. c. of B= .00012 or 1/ 8, 333	2.4 c. c. of B= .00024 or 1/4, 166
1.3 c. c. of B= .00013 or 1/ 7, 692	2.5 c. c. of B= .00025 or 1/4, 000
1.4 c. c. of B= .00014 or 1/ 7, 143	2.6 c. c. of B= .00026 or 1/3, 846
1.5 c. c. of B= .00015 or 1/ 6, 666	2.7 c. c. of B= .00027 or 1/3, 703
1.6 c. c. of B= .00016 or 1/ 6, 250	2.8 c. c. of B= .00028 or 1/3, 571
1.7 c. c. of B= .00017 or 1/ 5, 882	2.9 c. c. of B= .00029 or 1/3, 448
1.8 c. c. of B= .00018 or 1/ 5, 555	3.0 c. c. of B= .00030 or 1/3, 333

TABLE NO. 18.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+ 9=1:1, 000 1 c. c.=0.001
C.—(1 of B)+19=1:20, 000 1 c. c.=0.00005

0.7 c. c. of C=0.000035 or 1/28, 571	1.9 c. c. of C=0.000095 or 1/10, 526
.8 c. c. of C= .000040 or 1/25, 000	2.0 c. c. of C= .000100 or 1/10, 000
.9 c. c. of C= .000045 or 1/22, 222	2.1 c. c. of C= .000105 or 1/ 9, 524
1.0 c. c. of C= .000050 or 1/20, 000	2.2 c. c. of C= .000110 or 1/ 9, 090
1.1 c. c. of C= .000055 or 1/18, 181	2.3 c. c. of C= .000115 or 1/ 8, 695
1.2 c. c. of C= .000060 or 1/16, 666	2.4 c. c. of C= .000120 or 1/ 8, 333
1.3 c. c. of C= .000065 or 1/15, 385	2.5 c. c. of C= .000125 or 1/ 8, 000
1.4 c. c. of C= .000070 or 1/14, 285	2.6 c. c. of C= .000130 or 1/ 7, 615
1.5 c. c. of C= .000075 or 1/13, 333	2.7 c. c. of C= .000135 or 1/ 7, 407
1.6 c. c. of C= .000080 or 1/12, 500	2.8 c. c. of C= .000140 or 1/ 7, 143
1.7 c. c. of C= .000085 or 1/11, 764	2.9 c. c. of C= .000145 or 1/ 6, 896
1.8 c. c. of C= .000090 or 1/11, 111	3.0 c. c. of C= .000150 or 1/ 6, 666

TABLE NO. 19.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+ 9=1:1,000 1 c. c.=0.001
C.—(1 of B)+29=1:30,000 1 c. c.=0.0000333

0.7 c. c. of C=0.0000233 or 1/42,857	1.9 c. c. of C=0.0000633 or 1/15,799
.8 c. c. of C= .0000266 or 1/37,500	2.0 c. c. of C= .0000666 or 1/15,000
.9 c. c. of C= .00003 or 1/33,333	2.1 c. c. of C= .00007 or 1/14,285
1.0 c. c. of C= .0000333 or 1/30,000	2.2 c. c. of C= .0000733 or 1/13,642
1.1 c. c. of C= .0000366 or 1/37,322	2.3 c. c. of C= .0000766 or 1/13,055
1.2 c. c. of C= .00004 or 1/25,000	2.4 c. c. of C= .00008 or 1/12,500
1.3 c. c. of C= .0000433 or 1/23,095	2.5 c. c. of C= .0000833 or 1/12,000
1.4 c. c. of C= .0000466 or 1/21,428	2.6 c. c. of C= .0000866 or 1/11,547
1.5 c. c. of C= .00005 or 1/20,000	2.7 c. c. of C= .00009 or 1/11,111
1.6 c. c. of C= .0000533 or 1/18,761	2.8 c. c. of C= .0000933 or 1/10,504
1.7 c. c. of C= .0000566 or 1/17,668	2.9 c. c. of C= .0000966 or 1/10,352
1.8 c. c. of C= .00006 or 1/16,666	3.0 c. c. of C= .0001 or 1/10,000

TABLE NO. 20.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+ 9=1:1,000 1 c. c.=0.001
C.—(1 of B)+39=1:40,000 1 c. c.=0.000025

0.7 c. c. of C=0.0000175 or 1/57,142	1.9 c. c. of C=0.0000475 or 1/21,053
.8 c. c. of C= .00002 or 1/50,000	2.0 c. c. of C= .00005 or 1/20,000
.9 c. c. of C= .0000225 or 1/44,444	2.1 c. c. of C= .0000525 or 1/19,048
1.0 c. c. of C= .000025 or 1/40,000	2.2 c. c. of C= .000055 or 1/18,181
1.1 c. c. of C= .0000275 or 1/36,363	2.3 c. c. of C= .0000575 or 1/17,391
1.2 c. c. of C= .00003 or 1/33,333	2.4 c. c. of C= .00006 or 1/16,666
1.3 c. c. of C= .0000325 or 1/30,769	2.5 c. c. of C= .0000625 or 1/16,000
1.4 c. c. of C= .000035 or 1/28,571	2.6 c. c. of C= .000065 or 1/15,384
1.5 c. c. of C= .0000375 or 1/26,666	2.7 c. c. of C= .0000675 or 1/14,814
1.6 c. c. of C= .00004 or 1/25,000	2.8 c. c. of C= .00007 or 1/14,285
1.7 c. c. of C= .0000425 or 1/23,529	2.9 c. c. of C= .0000725 or 1/13,793
1.8 c. c. of C= .000045 or 1/22,222	3.0 c. c. of C= .000075 or 1/13,333

TABLE NO. 21.

A.— 1+99=1:100 1 c. c.=0.01
B.—(1 of A)+ 9=1:1,000 1 c. c.=0.001
C.—(1 of B)+49=1:50,000 1 c. c.=0.00002

0.7 c. c. of C=0.000014 or 1/71,428	1.9 c. c. of C=0.000038 or 1/26,316
.8 c. c. of C= .000016 or 1/62,500	2.0 c. c. of C= .000040 or 1/25,000
.9 c. c. of C= .000018 or 1/55,555	2.1 c. c. of C= .000042 or 1/23,809
1.0 c. c. of C= .000020 or 1/50,000	2.2 c. c. of C= .000044 or 1/22,818
1.1 c. c. of C= .000022 or 1/45,454	2.3 c. c. of C= .000046 or 1/21,739
1.2 c. c. of C= .000024 or 1/41,666	2.4 c. c. of C= .000048 or 1/20,833
1.3 c. c. of C= .000026 or 1/38,431	2.5 c. c. of C= .000050 or 1/20,000
1.4 c. c. of C= .000028 or 1/35,714	2.6 c. c. of C= .000052 or 1/19,230
1.5 c. c. of C= .000030 or 1/33,333	2.7 c. c. of C= .000054 or 1/18,518
1.6 c. c. of C= .000032 or 1/31,250	2.8 c. c. of C= .000056 or 1/17,857
1.7 c. c. of C= .000034 or 1/29,412	2.9 c. c. of C= .000058 or 1/17,241
1.8 c. c. of C= .000036 or 1/27,777	3.0 c. c. of C= .000060 or 1/16,666

LIST OF HYGIENIC LABORATORY BULLETINS OF THE PUBLIC HEALTH AND MARINE-HOSPITAL SERVICE.

The Hygienic Laboratory was established in New York, at the Marine Hospital on Staten Island, August, 1887. It was transferred to Washington, with quarters in the Butler Building, June 11, 1891, and a new laboratory building, located in Washington, was authorized by act of Congress, March 3, 1901.

The following *bulletins* [Bulls. Nos. 1–7, 1900 to 1902, Hyg. Lab., U. S. Mar.-Hosp. Serv., Wash.] have been issued:

*No. 1.—Preliminary note on the viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 2.—Formalin disinfection of baggage without apparatus. By M. J. Rosenau.

*No. 3.—Sulphur dioxid as a germicidal agent. By H. D. Geddings.

No. 4.—Viability of the *Bacillus pestis*. By M. J. Rosenau.

No. 5.—An investigation of a pathogenic microbe (*B. typhi murium* Danyz) applied to the destruction of rats. By M. J. Rosenau.

*No. 6.—Disinfection against mosquitoes with formaldehyd and sulphur dioxid. By M. J. Rosenau.

No. 7.—Laboratory technique: Ring test for indol, by S. B. Grubbs and Edward Francis; Collodium sacs, by S. B. Grubbs and Edward Francis; Microphotography with simple apparatus, by H. B. Parker.

By act of Congress approved July 1, 1902, the name of the "United States Marine Hospital Service" was changed to the "Public Health and Marine-Hospital Service of the United States," and three new divisions were added to the Hygienic Laboratory.

Since the change of name of the Service the bulletins of the Hygienic Laboratory have been continued in the same numerical order, as follows:

*No. 8.—Laboratory course in pathology and bacteriology. By M. J. Rosenau. (Revised edition March, 1904.)

*No. 9.—Presence of tetanus in commercial gelatin. By John F. Anderson.

No. 10.—Report upon the prevalence and geographic distribution of hookworm disease (uncinariasis or anchylostomiasis) in the United States. By Ch. Wardell Stiles.

*No. 11.—An experimental investigation of *Trypanosoma lewisi*. By Edward Francis.

*No. 12.—The bacteriological impurities of vaccine virus; an experimental study. By M. J. Rosenau.

*No. 13.—A statistical study of the intestinal parasites of 500 white male patients at the United States Government Hospital for the Insane; by Philip E. Garrison, Brayton H. Ransom, and Earle C. Stevenson. A parasitic roundworm (*Agamomermis culicis* n. g., n. sp.) in American mosquitoes (*Culex sollicitans*); by Ch. Wardell Stiles. The type species of the cestode genus *Hymenolepis;* by Ch. Wardell Stiles.

No. 14.—Spotted fever (tick fever) of the Rocky Mountains; a new disease. By John F. Anderson.

No. 15.—Inefficiency of ferrous sulphate as an antiseptic and germicide. By Allan J. McLaughlin.

*No. 16.—The antiseptic and germicidal properties of glycerin. By M. J. Rosenau.

*No. 17.—Illustrated key to the trematode parasites of man. By Ch. Wardell Stiles.

*No. 18.—An account of the tapeworms of the genus *Hymenolepis* parasitic in man, including reports of several new cases of the dwarf tapeworm (*H. nana*) in the United States. By Brayton H. Ransom.

*No. 19.—A method for inoculating animals with precise amounts. By M. J. Rosenau.

*No. 20.—A zoological investigation into the cause, transmission, and source of Rocky Mountain "spotted fever." By Ch. Wardell Stiles.

No. 21.—The immunity unit for standardizing diphtheria antitoxin (based on Ehrlich's normal serum). Official standard prepared under the act approved July 1, 1902. By M. J. Rosenau.

*No. 22.—Chloride of zinc as a deodorant, antiseptic, and germicide. By T. B. McClintic.

*No. 23.—Changes in the Pharmacopœia of the United States of America. Eighth Decennial Revision. By Reid Hunt and Murray Galt Motter.

No. 24.—The International Code of Zoological Nomenclature as applied to medicine. By Ch. Wardell Stiles.

No. 25.—Illustrated key to the cestode parasites of man. By Ch. Wardell Stiles.

No. 26.—On the stability of the oxidases and their conduct toward various reagents. The conduct of phenolphthalein in the animal organism. A test for saccharin, and a simple method of distinguishing between cumarin and vanillin. The toxicity of ozone and other oxidizing agents to lipase. The influence of chemical constitution on the lipolytic hydrolysis of etheral salts. By J. H. Kastle.

No. 27.—The limitations of formaldehyde gas as a disinfectant with special reference to car sanitation. By Thomas B. McClintic.

No. 28.—A statistical study of the prevalence of intestinal worms in man. By Ch. Wardell Stiles and Philip E. Garrison.

*No. 29.—A study of the cause of sudden death following the injection of horse serum. By M. J Rosenau and John F. Anderson.

No. 30.—I. Maternal transmission of immunity to diphtheria toxine. II. Maternal transmission of immunity to diphtheria toxine and hypersusceptibility to horse serum in the same animal. By John F. Anderson.

No. 31.—Variations in the peroxidase activity of the blood in health and disease. By Joseph H. Kastle and Harold L. Amoss.

No. 32.—A stomach lesion in guinea pigs caused by diphtheria toxine and its bearing upon experimental gastric ulcer. By M. J. Rosenau and John F. Anderson.

No. 33.—Studies in experimental alcoholism. By Reid Hunt.

No. 34.—I. *Agamofilaria georgiana* n. sp., an apparently new roundworm parasite from the ankle of a negress. II. The zoological characters of the roundworm genus *Filaria* Mueller, 1787. III. Three new American cases of infection of man with horsehair worms (species Paragordius varius), with summary of all cases reported to date. By Ch. Wardell Stiles.

No. 35.—Report on the origin and prevalence of typhoid fever in the District of Columbia. By M. J. Rosenau, L. L. Lumsden, and Joseph H. Kastle. (Including articles contributed by Ch. Wardell Stiles, Joseph Goldberger, and A. M. Stimson.)

No. 36.—Further studies upon hypersusceptibility and immunity. By M. J. Rosenau and John F. Anderson.

No. 37.—Index-catalogue of medical and veterinary zoology. Subjects: Trematoda and trematode diseases. By Ch. Wardell Stiles and Albert Hassall.

No. 38.—The influence of antitoxin upon post-diphtheritic paralysis. By M. J. Rosenau and John F. Anderson.

No. 39.—The antiseptic and germicidal properties of solutions of formaldehyde and their action upon toxines. By John F. Anderson.

No. 40.—Miscellaneous zoological papers. By Ch. Wardell Stiles and Joseph Goldberger.

No. 41.—Milk and its relation to the public health. By various authors.

No. 42.—The thermal death points of pathogenic micro-organisms in milk. By M. J. Rosenau.

No. 43.—The standardization of tetanus antitoxin. An American unit established under authority of the act of July 1, 1902. By M. J. Rosenau and John F. Anderson.

In citing these bulletins, beginning with No. 8, bibliographers and authors are requested to adopt the following abbreviations: Bull. No. ——, Hyg. Lab., U. S. Pub. Health & Mar.-Hosp. Serv., Wash., pp. ——.

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